



**CORNING-PAINTED POST
AREA SCHOOL DISTRICT**

Students are the center of all we do.

PROJECT MANUAL

CONTRACT DOCUMENTS – VOLUME II

for

Corning-Painted Post Area School District
2025 Middle School Phase III Alterations Project
35 Victory Highway. Painted Post, NY 14870

SED #: 57-10-00-01-0-024-044 - Middle School

The design of this project conforms to all applicable provisions of the New York State Uniform Fire Prevention and Building Code, the Energy Conservation Construction Code of New York State, and the building standards of the New York State Education Department

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ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 SCOPE

- A. This section and drawings specify the procedures for disturbance and removal of existing Asbestos Containing Materials (ACM) and disposal of ACM associated with the renovations of the Corning-Painted Post Middle School located 35 Victory Highway, Painted Post, New York.

1.2 RELATED DOCUMENTS

- A. Laboratory reports with summary of bulk asbestos analysis results are available in the Architect/Certified Project Designer's office.
- B. The Contractor shall be responsible for investigating the site and verifying conditions and quantities prior to the submission of his bid. The Contractor shall not be permitted changes in the contract amount if specific variances are denied by New York State Department of Labor, Architect/Certified Project Designer, or any other agency.
- C. A site specific variance may be applied for at the Contractor's cost. Use of a site specific variance requires approval of the Asbestos Abatement Project Designer.

1.3 REGULATORY REQUIREMENTS

- A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- B. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).
- D. NYS DEC Title 6 NYCRR Part 360 - Solid Waste Management Facilities General Requirements; current edition.
- E. NYS DEC Title 6 NYCRR Part 364 - Waste Transporters; current edition.
- F. NYS DOH Title 10 NYCRR Part 73 - Asbestos Safety Program Requirements; current edition.
- G. NYS DOL Title 12 NYCRR Part 56 - Asbestos; current edition.
- H. USEPA Title 40 CFR Part 61 - National Emissions Standards for Hazardous Air Pollutants; current edition.
- I. USEPA Title 40 CFR Part 763, Subpart E - Asbestos Containing Materials in Schools; current edition.
- J. USEPA 530-SW-85-007 - Asbestos Waste Management Guidance; current edition.

1.4 SCOPE

- A. All work of this section shall be performed in accordance with 12 NYCRR Part 56 as most currently amended unless permitted otherwise by the NY State Department of Labor, the USEPA and the Owner's Representative.
- B. The Contractor shall conform to New York Industrial Code Rule 56 as most currently amended.

- C. Furnish all labor, materials, licenses, facilities, equipment, services, employee training and testing, permits and agreements necessary to perform the work required for asbestos removal, encapsulation and enclosure in accordance with these specifications, the latest regulations from the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Asbestos Hazard Emergency Response Act (AHERA), the State of New York, the recommendations of the National Institute of Occupational Safety and Health (NIOSH) and Standard 241 of the National Fire Protection Association (NFPA).
- D. The asbestos abatement phase of the project will be multi-phased, each phase will be coordinated with the General Contract, Construction Manager, and the Corning Painted Post CSD representative so that no scheduling issues occur between other construction workers and Abatement Contractor.
- E. Before submitting his/her proposal, the Contractor shall be held responsible for having examined the premises to have satisfied himself/herself as to the existing conditions of the premises and limitations under which the work shall be executed. No allowance shall subsequently be made on the behalf of the Contractor by reason of error or neglect on his/her for having to follow the instructions here given.
- F. When submitting the proposal, the Contractor shall give written notice to the owner of any item in violation of laws, ordinances, rules or the regulations of all agencies having jurisdiction and notice of any items omitted. If no such notice is received, it shall be assumed that the Contractor has included the cost of all items in his/her proposal.
- G. The Asbestos Abatement Contractor shall coordinate all work with the phasing plan provided in contract documents. Please note the building owner reserves the right to change the phasing plan and dates of each phase of project based on the needs of the facility.
- H. Asbestos containing pipe Insulation including elbows and joints may be hidden behind walls and ceilings of the school building and may be impacted by the Demolition and plumbing Contractor during their work. If suspect asbestos containing materials are located, the Contractor must stop work and request the building owners representative for additional information and how to proceed via an RFI.
- I. If the asbestos Contractor applies for and application for NYDOL site-specific Variance, the Contractor is responsible for the preparation of the site-specific variance and any fees associated with the submission of any site-specific variance or(s) requested from NYDOL. Prior to submission, the Contractor shall submit the variance to the project design team for review.
- J. During the demolition of casework units and cabinets, asbestos containing floor tile or vapor barriers with mastic may be discovered. If asbestos containing floor tile, vapor barrier or mastic is identified during demo, the Contractor shall stop work and notify the building owners representative requesting additional information via RFI.
- K. All floor tile vapor barrier and mastic removal utilizing manual methods and chemical procedures must be completed utilizing Non-Friable flooring or mastic removal Industrial Code Rule 56-11. 7.
- L. The Asbestos Abatement Contractor can utilize either Manual/Chemical or Bead Blast Methods for the removal of the asbestos containing floor tiles and mastics. The mastic remover must be a bio-degradable low odor product "Bean E Doo" or the Contractor can submit a similar bio-degradable product for approval as an approved equal.

1.5 SUBMITTALS

- A. Pre-Work Submittals: The Contractor shall submit to the Architect/Certified Project Designer three (3) copies of the documents listed below:
 - 1. Resume: Shall include the following:

- a. Contractor license issued by New York State Dept. of Labor.
 - b. The number of years engaged in asbestos removal.
 - c. Provide a list of projects performed within the past two years and include the dollar value of all projects. Provide project references to include owner, consultant, and air-monitoring firms' name, contact person, address, and phone number.
 - d. An outline of the worker training course and medical surveillance program conducted by the Contractor.
 - e. Emergency plans, including proposed work area evacuation routes and fire extinguisher locations.
- B. Citations/Violations/Legal Proceedings: Submit a notarized statement describing:
1. Any citations, violations, criminal charges, or legal proceedings undertaken or issued by any law enforcement, regulatory agency, or consultant concerning performance on previous abatement contracts. Briefly describe the circumstances citing the project and involved persons and agencies as well as the outcome of any actions.
 2. Any Stop Work Orders issued on projects within the past two years.
 3. Any litigation or arbitration proceedings arising out of performance on past projects.
 4. Any liquidated damages assessed within the last two years.
- C. Progress Schedule:
1. Show the complete sequence of construction by activity and the sequencing of work within each building or section of the work.
 2. Show the dates for the beginning and completion of each major element of work including substantial completion dates for each work area, building, or phase.
 3. Show final inspection dates.
- D. Site Specific Variance: Submit all proposed site specific variances for this project to the Architect for review and approval.
- E. Schedule of Values: Prepare a schedule of values, as required by the General Conditions identifying the value of work, by work area, associated with each type of asbestos material included in the scope of work. Identify mobilization and administration costs separately.
- F. Notifications: Submit notifications required by federal, state, and local regulations together with proof of timely transmittal to agencies requiring the notice (e.g. certified mail return receipt).
- G. Permits: Submit copies of current valid permits required by state and local regulations, including arrangements for storage, transportation, and disposal of contaminated materials.
- H. Abatement Work Plan: Provide plans which clearly indicate all work areas (numbered sequentially) including the locations and types of all decontamination chambers, entrances and exits to the work area, type of abatement activity/technique, number and location of negative air units and exhaust including calculations, and the proposed location and construction of storage facilities and field office.
- I. Equipment: Submit manufacturer's information of vacuums, negative air pressure equipment, respirators, and air supply equipment, etc. Provide certification that all equipment meets applicable requirements of OSHA and EPA.
- J. Worker Training and Medical Surveillance: The Contractor shall submit a list of the persons who will be employed by him and his Subcontractors in the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- K. (Sub)-Subcontractors List: The abatement (sub)-Contractor shall submit a list of all Sub-Subcontractors to be used on the project.
- L. Project Supervisor: Submit the resume of the proposed Project Supervisor. Identify work history and substantiate ability to supervise this project.

- M. Rental Notifications: Submit copies of notices sent to rental suppliers informing them of the nature of the work that the Contractor intends to use the equipment for.
- N. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of asbestos containing materials; understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.
- O. Project Closeout Submissions:
 - 1. Submit copies of all waste disposal manifests, and disposal logs.
 - 2. Submit OSHA compliance air monitoring records conducted during the work.
 - 3. Submit copies of the daily progress log.
 - 4. Submit copies of the visitor's log.
 - 5. Submit Certificate of visual inspection obtained from the Project Monitor.
 - 6. Submit a list of all employees utilized on the project with social security and Asbestos Handler Certificate numbers.
 - 7. Submit copies of any required Employee Statements such as Medical Examination statement, Certificate of Worker's Release, or Employee Training Statement.
 - 8. Submit 3 copies of a description of work to be included in the Owner's AHERA Management Plan Building record. Indicate asbestos materials removed and quantities for each area(s) of abatement.

1.6 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall be on-site at all times work is in progress. If the Project Supervisor is not on-site, all work shall be stopped. The Project Supervisor must be able to read and write English fluently, as well as communicate with his workers. The Project Supervisor shall remain until the project is complete and cannot be removed without the written consent of the Owner and the Architect/Certified Project Designer.
- B. Prior to the commencement of work, the Contractor shall submit the proposed Project Supervisor's resume to the Owner and Architect/Certified Project Designer for approval. The Project Supervisor shall meet the requirements of a "Competent Person" as defined by OSHA 1926.58 and shall have a minimum of one-year on-the-job training. This person shall hold certification as an Asbestos Project Supervisor.

1.7 PROJECT MONITOR

- A. An Asbestos Project Monitor, shall be retained by the Owner to provide abatement project inspection and monitoring services. This firm is responsible for ensuring that all abatement activities are in full compliance with all applicable federal, state, and local laws, rules, and regulations, and the contract documents.
- B. The Asbestos Project Monitor shall have personnel on-site at all times the Contractor is on-site. The Contractor shall not be permitted to conduct any work, including mobilization and preparation, unless the Asbestos Project Monitor consultant is on-site.
- C. The Asbestos Project Monitor, and his on-site representative, shall have the authority to direct the actions of the Contractor verbally and in writing to ensure compliance with the project documents and all regulations. The Asbestos Project Monitor shall have the authority to stop work when gross work practice deficiencies or unsafe practices are observed.
- D. The Asbestos Project Monitor shall provide the following functions:
 - 1. Inspections of Contractor's work, practices, and procedures for compliance with all regulations and project specifications. Notify the Owner/Architect of Contractor non-compliance during the project.

2. Maintain a daily log on-site of all activities undertaken by the Contractor, all visitors to the site, and any unusual events.
 3. The inspector shall turn over copies of all daily logs and any other reports prepared in the field to the Architect/Certified Project Designer.
 4. Verify daily that all workers used in the performance of the project is certified by the appropriate regulatory agency.
 5. Monitor the progress of the Contractor's work and report any deviations from the schedule to the Architect/Certified Project Designer.
 6. Monitor, verify, and document all waste load-out operations. The Project Monitor shall maintain a disposal log indicating the time, date, quantity, and destination (including hauler information) of all waste removed from the site.
 7. The Project Monitor shall ensure that the waste disposal procedures are being followed, including the use of container seals and the Authority's waste manifest.
 8. Verify that the Contractor is performing personal air monitoring daily, and that results are being returned and posted at the site as required.
 9. Verify that all materials and equipment delivered to the site are in conformance with the contract documents and approved submittals.
 10. Ensure that all warning signs and notices required of the owner and the Contractor are posted.
 11. Inspect each work area prior to abatement activities and document building damages prior to and after the Abatement Contractor performs the work.
 12. Inspect each work area to verify total asbestos abatement in accordance with the contract documents prior to clearance air sampling.
 13. Attend regular meetings to discuss project related issues.
 14. Deliver a bound final report to the Owner within 30 days of the completion of monitoring services which contains all project monitoring documentation, credentials, an executive summary of the activities included in the report, and a statement that confirms that all monitoring and air sampling has been completed in compliance with New York State Department of Labor and Environmental Protection Agency regulations.
 15. The selected monitoring company shall NOT be permitted to provide testing and/or consulting services to the selected Asbestos Abatement Contractor for any work on this project.
- E. The Project Monitoring services have been contracted for Monday through Friday, 9 hours per day. The time lines that have been established are based on the Owner's needs and the Contractor completing the work with sufficient manpower, supplies and organization within the scheduled time. If more hours are needed due to a lack of the Contractor's ability to meet the scheduled time lines, the cost for additional Project Monitoring shall be the responsibility of the Contractor.

1.8 AIR SAMPLING REQUIREMENTS

- A. Air Sampling shall be conducted as required by New York State regulations.
- B. Unless otherwise required by applicable regulations, samples shall be analyzed by Phase Contrast Microscopy (PCM) and final clearance air samples by Transmission Electron Microscopy (TEM) as outlined by paragraphs below. Chain of Custody must be maintained for all samples.
- C. Analytical services shall be provided by a laboratory certified by the New York State Department of Health Environmental Laboratory Approval Program specifically for the analytical procedure being used.
- D. Air sampling shall be performed by an individual with at least six months experience in abatement project air sampling and shall hold certification as a New York State Asbestos Handler or Asbestos Project Air Sampling Technician as required by applicable New York State regulations.

- E. The Asbestos Project Air Sampling Technician shall maintain a log on-site of all air monitoring conducted and the results of such monitoring.
 - F. The air sampling technician must have an adequate quantity of equipment required to conduct the necessary air monitoring, including a sufficient number of air sampling pumps as well as leaf blowers and fans required for aggressive clearance air monitoring.
 - G. To help maintain scheduled time lines, the work is divided into work areas for air monitoring as grouped below. Each area shall have separate pre, during and post abatement monitoring.
 - H. Pre-abatement air samples shall be collected before the Contractor arrives on site.
 - I. During abatement samples shall be collected at locations selected by the PM/AST.
 - J. Inside air samples shall be collected by the PM/AST. These samples shall not be used to satisfy the Contractor's responsibility for personal sampling.
 - K. TEM and PCM final air samples shall be collected in the same locations as the pre-abatement air samples.
 - L. Required Inspections - The following minimum inspections shall be conducted by the Asbestos Project Monitor. Additional inspections shall be conducted as required by project conditions. Progression from one phase of work to the next by the Contractor is only permitted with the written approval of the Project Monitor.
 - 1. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the work areas and to documents these conditions. It shall be conducted with the owner, Asbestos Project Monitor, Contractor, and the Architect/Certified Project Designer (as appropriate) prior to release of the building to the Abatement Contractor.
 - 2. Pre-Commencement Inspection: The purpose of the inspection is to verify the integrity of each containment system prior to disturbance of any asbestos containing material. This inspection shall take place only after the work area is fully prepped for removal.
 - 3. Work Inspections: The purpose of this inspection is to monitor the work practices and procedures employed on the project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the Asbestos Project Monitor during preparation and removal activities at least twice every work shift.
 - 4. Visual Clearance Inspection: The purpose of this inspection is to verify the Contractor's certification that all materials have been removed from the work area and the absence of all visible accumulations of debris in the work area. This inspection shall be conducted after encapsulation and removal of all surface plastic in the area, but before final air clearance testing. Critical barriers shall remain in place.
 - 5. Punch List Inspection: The purpose of this inspection is to verify the Contractors' certification that all work has been completed as contracted and the condition of the existing area prior to its release to the owner.
- 1.9 LARGE ASBESTOS ABATEMENT PROJECT (260 LINEAR FEET OR 160 SQUARE FEET OR GREATER)
- A. Pre-abatement sampling; Five (5) samples inside and five (5) samples outside the work area plus required blanks. Analysis by PCM
 - B. During abatement; Five (5) samples outside the work area plus required blanks. Analysis by PCM
 - C. Final clearance air samples;
 - 1. Up to five (5) aggressive air samples inside and five (5) standard outside the work area plus required blanks. Analysis by TEM. Minimum requirement in compliance with New York State Department of Labor approved Specific Variance and New York State Education Department Final Clearance Air Sampling clarification, dated August 2007.

2. Up to five (5) aggressive air samples inside and five (5) standard outside the work area plus required blanks. Analysis by PCM. Minimum requirement in compliance with New York State Department of Labor approved Specific Variance.
3. If one or both sets of samples do not meet the above stated final clearance air sample criteria, the Contractor shall re-clean the work area and a complete duplicate set of final clearance air samples shall be collected by the Project Monitor/Air sample Technician. The Contractor shall be responsible for all cost of the air sampling and subsequent analysis until all final clearance air sample criteria has been achieved.

1.10 SCOPE OF WORK

- A. The quantities listed in the tables are for informational purposes ONLY. The Contractor shall be responsible for ALL asbestos containing materials within the work areas.
- B. Work areas are as follows:
 1. Work Area #1 – Involves the abatement of asbestos containing sealants approximately 25 Square feet around exterior doors and lights of the Auxiliary Gym. Remove 16 bolts from the 4 wall mounted backstops. Install 75LF of 6'-0" high wall pads.
 2. Work Area #2– Involves the abatement of asbestos containing floor tile and mastic Approximately 1,380 Square feet located in the corridor adjacent to the Pool.
 3. Work area # 3 Involves the abatement of asbestos containing floor tile and mastic. Approximately 2,780 Square feet located in Classroom E101 & E103.
 4. Work area #4 Involves the abatement of asbestos containing floor tile and mastic. Approximately 709 Square feet located in room C-112.
- C. The work shall be completed in multiple phases within the following schedule:
 1. Work Area #1 Aux Gym door & light sealants, backstop removal and wall pad installation Completed in 10 working days.
 2. Work Area #2 Pool corridor floor tile and mastic abatement Completed in 10 working days.
 3. Work Area # 3 Classroom E-101 & E-103 floor tile and mastic abatement. Completed in 10 working days.
 4. Work Area #4 Classroom C-112 floor tile and mastic abatement. Completed 5 working days.
- D. The Asbestos Abatement Contractor shall remove existing carpet floor finishes at locations where present over existing asbestos containing floor tile.
- E. The Contractor shall remove vinyl and/or wood base and mastic where present in concurrence with the removal of vinyl asbestos floor tile.
- F. Dumpster locations and lift usage shall be subject to acceptance by the Architect/Certified Project Designer.
- G. If final clearance air samples do not meet the criteria as regulated by New York State Department of Labor and the New York State Education Department, the Contractor shall re-clean the work area and a complete, duplicate set of final clearance air samples, shall be collected by the Project Monitor/Air Sampling Technician. The Contractor shall be responsible for all cost of the air sampling and subsequent analysis until all final clearance air sample criteria has been achieved.
- H. An asbestos demolition survey is available for review. The Contractor shall be responsible for the abatement of all asbestos containing materials in preparation for demolition by others. If bulk sampling is required to determine a complete abatement the Owner shall perform all testing, and all sampling costs shall be the responsibility of the Contractor.
- I. Only low odor mastic remover shall be approved for use. Mastic remover must be thoroughly cleaned from all areas of the building. Permeable materials (wood, drywall, carpets, plaster,

etc.) must be protected from absorbing the mastic remover solvents. Mastic remover application and cleanup instructions must be strictly followed. A minimum of two soap and water washes must be provided on all surfaces where mastic remover was applied. The Asbestos Abatement Contractor shall be responsible to assure that the mastic remover is compatible with scheduled finishes to maintain all product system warranties.

- J. Mastic shall be removed thoroughly to the point at which scraping mastic with a metal scraper will not produce build-up of mastic material on the scraper.
- K. The Abatement Contractor shall disconnect and remove existing unit ventilators and unit ventilator metal shelving. The Asbestos Abatement Contractor shall removal vinyl asbestos floor tile below unit ventilator and unit ventilator shelving. The Abatement Contractor shall reconnect existing unit ventilators and unit ventilator shelving to existing layout.
- L. Any encapsulant, mastic remover or other product used, shall be compatible with the new finishes. It shall be the Contractor's responsibility to coordinate the product being used with the new finish products. No encapsulant, mastic remover and/or other product shall be used that has not been approved.
- M. Owner's personnel shall move all equipment, furniture, etc. that is not fixed in place. The Contractor shall be responsible to remove all other items unless noted otherwise. The Contractor shall be responsible for all system disconnection and reconnections associated with the work including but not limited to lights, fire alarm, HVAC equipment, etc.
- N. The Contractor shall be responsible to employ removal methods, sufficient cleaning and/or other such means, methods or equipment to provide areas free of odors, fumes, and/or irritants or residues. The Contractor shall respond and remove the cause of such odors, fumes or irritants at its own expense if notified by the Owner or Architect/Certified Project Designer, within six months of the date of substantial completion.
- O. The Contractor shall be responsible for removing all asbestos containing sealant/caulk at doors or exterior light fixtures noted. No residual caulk will remain around the doors or light fixtures. The Contractor shall be responsible for the demolition, abatement and disposal of doors and light fixtures and caulk. Coordinate time of door frame and light fixture removal with the provision of new light fixtures and doors supplied by the general trades Contractor.

1.11 LICENSING AND CERTIFICATION

- A. The Contractor must have successfully completed a Contractor supervisor course approved by the EPA.
- B. The Contractor must hold a valid State of New York, Department of Labor asbestos Contractor's license. A copy of this asbestos license shall be conspicuously displayed proximate to but outside the work area during the duration of the project.
- C. The Contractor shall permit only those persons who hold valid State of New York Department of Labor asbestos handling certificates to engage in work on this project.
- D. The Contractor shall have EPA Certification as an Asbestos Contractor.

PART 2 UTILITIES

2.1 WATER:

- A. When feasible, interrupt the flow of water to areas where asbestos removal shall be conducted. This requirement shall be mandatory in areas of demolition.

- B. The Owner shall furnish access to water required for construction, at no cost to the Contractor. The Contractor shall be responsible for any plumbing work or fixtures necessary to connect to the Owner's existing system, and shall be required to provide anti-siphon devices at the connection to the Owner's water system.
- C. Contaminated water shall be treated by a several stage filter system consisting minimally of a 25 micron filter followed by a 5 micron filter and typically by a 5 micron, 50 micron and 100 micron filter series prior to disposal in a municipal sewage system. This process may only be used when not contrary to local ordinances.
- D. Coordinate with the Owner for the nearest hookup and drainage. It shall be the Contractor's responsibility to connect the water source to the location needed and to provide required drainage.

2.2 ELECTRICITY:

- A. Electricity shall be from the Owner's designated panel box, through the Contractor's power board, to the work area. The Contractor shall supply the air-monitoring firm with sufficient outlets.
- B. The Contractor shall label any circuits disabled in conjunction with the work; "TEMPORARILY DISCONNECTED DUE TO RENOVATION WORK. DO NOT ACTIVATE THESE CIRCUITS – SAFETY HAZARD".
- C. The Contractor shall supply a power board on site designed to handle the expected electrical load during the project. The power board shall be installed, tested and activated prior to any other site work for the execution of this contract. This work shall be accomplished by a properly trained and experienced electrician.
- D. Provide as required by 29 CFR 1926, temporary 120/240 Volt, single phase, three wire, 100 amp electric service with Ground Fault circuit Interrupters (GFCI) for electrical requirements for the project. No damaged electrical cords shall be allowed on site. Draw out power service from Owner's existing power panel to service the Contractor's power board. Each HEPA unit shall be circuited to a separate and unique breaker with a minimum of 15 amp. service to prevent multiple loss of negative pressure units.
- E. Provide temporary lighting with "weatherproof" fixtures for work areas including the decontamination chambers.
- F. Provide electrical service as needed by the Project Monitor and the AST (including GFCI). Minimum electrical services that are to be provided include:
 - 1. Six 15 amp. protected 3 prong outlets within the work area.
 - 2. Six 15 amp protected 3 prong outlets for work areas outside of the containment zone or area.
 - a. The Owner shall not be responsible for making available to the Contractor temporary electrical service systems.
 - b. The Contractor shall supply power and connections to maintain fire alarms and security system in non-work areas. The Contractor may also be required to provide temporary electrical service to occupied portions of the building.

PART 3 EXECUTION

3.1 WORK AREA PREPARATION

- A. The work area shall be vacated by the occupants prior to work area preparation and until satisfactory clearance air monitoring results have been achieved.

- B. Caution signs meeting the specifications of OSHA 29 CFR 1910.1001(j) shall be posted at all locations and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted that permit a person to read the sign and take the necessary protective measures to avoid exposure.
- C. Shut down and lock out electric power to all work areas. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment used where high humidity and/or water shall be sprayed in accordance with all applicable codes. All power to work areas shall be brought in from outside the area through a ground-fault circuit interrupter at the source.
- D. The personal decontamination enclosure system shall be installed or constructed prior to preparatory work in the work area and in particular before the disturbance of asbestos material. The waste decontamination enclosure system shall be installed or constructed prior to commencement of abatement activities.
- E. Heating, Ventilating and Air Conditioning (HVAC) System Isolation. Acceptable methods for HVAC system isolation shall include conformance with NYCRR Title 12, Subpart 56-8.
- F. Shutdown and isolation HVAC systems to prevent contamination and asbestos dispersal to other areas of the building or structure.
- G. Contaminated HVAC filters shall be handled and disposed of as asbestos waste material. The ducts and filter assembly shall be wet cleaned and/or HEPA vacuumed where system air samples and/or dust samples indicate asbestos contamination.
- H. Fixed objects and other items, which are to remain within the work area, shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning. Such objects and items shall be enclosed with two layers of at least six-mil plastic sheeting and sealed with tape.
- I. The work area shall be cleaned using HEPA filtered vacuum equipment and/or wet cleaning. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be permitted.
- J. Isolation barriers that seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other penetrations of the work area shall be constructed using two layers of at least six mil, fire retardant plastic sheeting sealed with tape. Also, all seams in system components that pass through the work area shall be sealed. Doorways and corridors, which shall not be used for passage during work, shall also be sealed.
- K. Separation of the work area from the remainder of the work site by construction of isolation barriers shall be accomplished as follows:
 - 1. Wall shall be constructed of wood or metal framing to support barriers in all openings larger than thirty-two square feet, except where any one dimension is one foot, or less.
 - 2. A sheathing material of at least three-eighths inch thickness shall be applied to the work side of the barrier.
 - 3. Edges of the partition shall be caulked at the floor, ceiling, walls and fixtures to form an airtight seal.
 - 4. The work area side of the partition shall be covered with a double layer of at least six-mil, fire retardant plastic sheathing with staggered joints and sealed.
- L. Emergency and fire exits from the work area shall be maintained or alternate exits shall be established according to all applicable codes.

3.2 TRANSPORTATION AND DISPOSAL

- A. Applicable Regulations:
 - 1. All asbestos waste shall be stored, transported and disposed of as per, but not limited to, the following regulations:

- a. NYS DEC 6 NYRCC part 360 and 364
 - b. USEPA NESHAPS 40 CFR 61
 - c. USEPA ASBESTOS WASTE MANAGEMENT GUIDANCE EPA/530-SW-85-007
- B. Transportation and Disposal Site:
1. The Contractor's hauler and disposal site shall be subject to the approval of the Project Monitor.
 2. The Contractor shall give 24-hour notification prior to removing any waste from the site. Waste shall be removed from site only during normal working hours unless otherwise specified. No waste may be taken from the site without authorization from the Project Monitor.
- C. Prior to the removal of any waste materials from the site, the Contractor shall submit a complete and valid copy of an "Industrial Waste Transporter Permit" specifically for asbestos-containing materials, pursuant to 6 NYCRR 364 for the transporting of waste. Only vehicles listed on this permit shall be allowed to transport waste materials from the site.
- D. Waste Shipment Record; Prior to the transport of any waste materials from the site, the Contractor shall submit a Waste Shipment Record (WSR) to the Project Monitor with generator and transporter sections completely filled in and signed for each day on which asbestos waste is removed from the site. Provide originally signed WSR to Project Monitor so he can make copies for records and return the originally signed WSR to transporter so that original signature of landfill agent can be entered upon delivery to landfill. This documentation shall include the amount of waste removed, in both numbers of bags or containers, which correspond to the Project Monitor's logged count and cubic yards. The WSR shall include the, name and address of the transporter, the landfill to which the waste is transported, the quantity accepted by the landfill and the signature of the landfill official who accepts the delivery. Waste Shipment Records bearing the original signature (carbon copy bearing impressions of the original signatures are acceptable) of the landfill agent receiving the waste must be received by the Owner/Architect/Certified Project Designer within 35 days of shipment. Failure to comply shall result in a detailed report being transmitted to the New York State Department of Labor and EPA-NESHAPS.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.
- B. Demolishing designated building equipment and fixtures.
- C. Demolishing designated construction.
- D. Removing designated items for Owner retention.
- E. Protecting items designated to remain.
- F. Removing demolished materials.

1.2 SUBMITTALS

- A. See Section 01 30 00 - 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.
 - 2. Demolition firm qualifications.
 - 3. Indicate location of items designated for Owner retention.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.3 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of ten years of documented experience.
- B. Design shoring, bracing, underpinning under direct supervision of Professional Engineer experienced in design of this Work and licensed the State of New York.
- C. Conform to applicable code for demolition work, safety of adjacent structures, dust control, products requiring electrical disconnection and re-connection.
- D. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.
- E. Obtain required permits from authorities having jurisdiction.

1.4 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.5 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.6 SCHEDULING

- A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.
- B. Schedule work to coincide with new construction.
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owner operations.
- D. Performance of noisy, malodorous, dusty, and removal of hazardous material work:
 - 1. Will not be permitted during school hours.
 - 2. All activities must be coordinated with the Owner to ensure that programming and services will be uninterrupted by construction activities and to ensure the safety of the students and occupants.
- E. Coordinate utility and building service interruptions with Owner.
 - 1. Do not disable or disrupt building fire or life safety systems without five days prior written notice to Owner.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.7 PROJECT CONDITIONS

- A. Buildings indicated to be demolished will be vacated before start of Work.
- B. Owner assumes no responsibility for actual condition of buildings to be demolished.
- C. Hazardous Materials: Known hazardous materials will be removed before start of Work. Notify Architect/Engineer upon discovery of a hazardous material.
- D. Each contractor shall be responsible for the cutting and patching of existing surfaces as required to complete the work of their contract unless noted otherwise.
- E. Conduct demolition to minimize interference with adjacent and occupied building areas.
- F. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 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. Coordinate demolition sequence and procedures to prevent structures from becoming unstable.
 3. 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.
 4. Layout cuts in post-tensioned concrete elements to avoid cutting concrete within 12 inches of any stressing tendon. Notify Architect five days in advance of cutting post-tensioned concrete.
 5. Provide, erect, and maintain temporary barriers and security devices.
 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks or hydrants without permit.
 9. 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.
 10. 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. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.
- E. 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.
- F. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- G. Verify hazardous material abatement is complete before beginning demolition.
- H. Carefully remove building components indicated to be reused.
1. Mark components and packaged parts to permit reinstallation.
 2. Store components, protected from construction operations until reinstalled.
- I. At completion of the demolition work restore, repair or refinish all building systems, components and finishes disturbed as the result of the demolition process.
- J. Remove foundation walls and footings to minimum of two feet below finished grade .

3.2 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.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.3 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. Separate areas in which demolition is being conducted from areas that remain occupied.
 - 1. Provide sound retardant partitions of construction and in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- D. Remove existing work as indicated and required to accomplish new work.
 - 1. Remove items indicated on drawings.
- E. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. 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.
- F. 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.

3.4 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.
- B. Tag components and equipment Owner designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.
- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.

- F. Package small and loose parts to avoid loss.
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.5 DEBRIS AND WASTE REMOVAL

- A. Remove materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- 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 02 41 00

SECTION 02 83 10 - LCP/LBP DISTURBANCES USING

LEAD SAFE WORK PRACTICES

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work covered by this Specification shall consist of furnishing all labor, materials, tools, and equipment necessary to control and mitigate potential lead-based paint (LBP) and lead-containing paint (LCP) material hazards during demolition/renovation activities pertaining to the project Corning Painted Post Middle School, 35 Victory Highway, Painted Post, New York.

This Specification shall be used as a guideline for Contractors who complete the demolition/renovation activities pertaining to this Project, as detailed within Section 1.01, B of this Specification. The intent of this Specification is to remain in conformance with Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1926.62 "Lead Exposure in Construction" and to maintain an airborne concentration of lead-dust below the Action Level. This Specification is written to outline the worst-case scenario regarding lead safe work practices.

- B. The following is a detailed listing of identified LBP and/or LCP, above the laboratory and/or device detection Limit:

Location	Component	Substrate	Concentration	Color	Condition
Room 507	Structural Steel	Steel	1.8 mg/kg ²	White	Good
Room 501A	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good
Room 202	Structural Steel	Steel	1.0 mg/kg ²	Tan	Good
Room315	Structural Steel column	Steel	1.0 mg/kg ²	White	Good
Corridor 500	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good
Room105	Structural Steel	Steel	1.0 mg/kg ²	White	Good
Room 024	Structural Steel column	Steel	1.0 mg/kg ²	Black	Good
Room023	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good
Mechanical room 69C	Structural Steel	Steel	1.0 mg/kg ²	Red	Good
Room 030	Metal	Metal	1.0 mg/kg ²	White	Good
Room 031	Cove base	Vinyl	3.1 mg/kg ²	Black	Good
Room 033	Cove base	Vinyl	4.5 mg/kg ²	Black	Good
Room 034	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good
Corridor 600	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good
Room 801A	Ceramic tile	Plaster	9,9 mg/kg ²	Pink	Good
Room 044	Structural Steel	Steel	1.0 mg/kg ²	White	Good
Room 814	Ceramic tile	Plaster	9,9 mg/kg ²	Blue	Good
Corridor 800	Ceramic tile	Plaster	9,9 mg/kg ²	Green	Good

It should be noted that several components tested did contain minimal lead-concentrations below the EPA threshold level of 1.0 mg/cm² or 0.5% by weight for classification as LBP and are considered lead-containing paints or coatings by 29CFR 1926.62. OSHA does not recognize a minimum limit for lead concentration in paint for the purpose of disturbance. Personal Air monitoring of workers performing demolition/cleaning/disturbance of painted surfaces shall be completed to document personnel occupational exposure and reviewed by the Contractor's Competent Person. Items containing any amount of lead concentration are considered lead-containing paints or coatings per

29 CFR 1926.62. See project environmental survey report for lead paint reports. Lead paint summary information is located within the Appendices of this specification.

For Storage, Transportation and Disposal requirements, refer to the Standard Specification for the Identification and Disposal of Hazardous Waste 028600.

- C. Manual demolition, scraping and sanding of lead-based paint or lead containing paint coated surfaces, power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).
- D. Components with LBP and LCP shall be removed intact to the extent practicable. A 6-mil polyethylene drop cloth shall be placed around and/or beneath the component, prior to its removal, to catch any paint chips that may become dislodged. Intact components shall be wrapped in a layer of clear 6-mil polyethylene prior to movement to the disposal container. The area around the component removal shall be wet wiped and high-efficiency particulate air (HEPA) filter vacuumed, including the tent enclosure (if applicable). The polyethylene sheeting shall be carefully folded in on itself and placed in a 6-mil disposal bag and sealed closed. All debris shall be properly disposed of in accordance with the respective waste stream Resource Conservation Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) testing results.
- E. Chemical stripping may be used for LBP and LCP removal on surfaces that will be subjected to welding, cutting, torch burning or where it is the only acceptable procedure. No chemical strippers containing methylene chloride shall be used by the Contractor on this project. SDS for stripping and neutralizing chemicals must be reviewed and approved by the Consultant prior to use and a copy shall be posted at the site.
- F. The Contractor's use of a subcontractor (must be approved) shall not relieve the Contractor of full responsibility for the work to be performed.
- G. If available and approved by the Competent Person, the Contractor may utilize exposure assessment data that is compliant with OSHA and was obtained within the last twelve (12) months from previous jobs conducted under similar conditions, control methods, work practices and environmental conditions to be used in this contract for LCP disturbances only. Other objective data may be used to demonstrate that work activities in this contract will not result in occupational exposures to airborne lead that exceeds the PEL for LCP disturbances only. The assessment shall include comparable lead concentrations (LCP only) in paint/coating materials, work practices, engineering controls and work schedules.
- H. The Contractor must provide his workers with the following: Respiratory protection in accordance with the Contractor's Respiratory Protection Program, personal protective clothing, lead-free change areas, hand washing/shower facilities, blood lead level monitoring and training per 29 CFR 1926.62. **Respiratory Protection is required for all LBP disturbances.**
- I. The Contractor shall ensure that any HVAC equipment intakes within and around the control areas are protected by shutting down the units. The Contractor shall alter the size and extent of the isolation barriers as necessary due to weather conditions, functional space use and density of building occupants in the vicinity, as required.

1.02 DEFINITIONS, REGULATIONS & REFERENCE STANDARDS

- A. Definitions (excerpted from 29 CFR 1926.62)

1. **Action Level:** Employee exposure, without regard to the use of respirators, to an airborne lead concentration of 30 micrograms per cubic meter (30 ug/m³) calculated as an 8-hour time-weighted average (TWA). Exceedance of the Action Level requires blood lead monitoring implementation.
2. **Competent Person:** One who can identify existing and predictable lead hazards in the surroundings or working conditions and who has the authorization to take prompt corrective measures to eliminate them. For LBP work, the Competent Person shall also be the on-site Supervisor/Foreman in-charge of the work crew.
3. **Exposure Assessment:** Each employer who has a workplace or operation covered by 29 CFR 1926.62 shall initially determine if any employee may be exposed to lead at or above the Action Level.
4. **Lead:** Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.
5. **Lead-Based Paint (LBP):** Paint, varnish, shellac or other coatings on surfaces that contain 1.0 milligram per square centimeter (1.0 mg/cm²) or more lead or 0.5% or more lead by weight. The concentration of 0.5% is equivalent to:
 - a. 5,000 parts per million (5,000 ppm) and.
 - b. 5,000 milligrams per kilogram (5,000 mg/kg)
6. **Lead-Containing Paint (LCP):** Paint, varnish, shellac or other coatings on surfaces that contain measurable concentrations less than 1.0 milligrams per square centimeter (1.0 mg/cm²) lead or less than 0.5% or more lead by weight including equivalents less than 5,000 ppm and 5,000 mg/kg. This does not include paint, varnish, shellac or other coatings on surfaces where the concentration is below the detection limit of the respective laboratory method / device.
7. **LBP Inspection:** A surface-by-surface investigation to determine the presence of LBP. A report is then issued that identifies if there is LBP present and where it is located.
8. **Lead Risk Assessor:** EPA trained and certified to conduct LBP inspections and collect samples for the presence of lead in air, dust and soil for the purposes of abatement clearance testing as well as conduct risk assessments.
9. **Permissible Exposure Limit (PEL):** The limit above which the employer shall not expose workers to lead. The current PEL for lead is 50 ug/m³ over an eight-hour time-weighted-average for all employees covered.

B. General Requirements

The Contractor is required to perform all work related to this project in strict accordance with all applicable Federal, State and Local regulations.

Where these requirements vary, the most stringent shall apply.

C. Specific Requirements

1. American National Standards Institute (ANSI)
ANSI Z9.2-79 – Fundamentals Governing the Design and Operation of Local Exhaust Systems.
2. Z88.2-80 – Practice for Respiratory Protection.
3. Code of Federal Regulations (CFR)
4. 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response.
5. 29 CFR Part 1910.134 – Respiratory Protection.

6. 29 CFR Part 1910.146 – Confined Space Entry Program.
7. 29 CFR Part 1910.1025 – Lead (General Industry Standard).
8. 29 CFR Part 1910.1200 – Hazard Communication.
9. 29 CFR Part 1926.55 – Gases, Vapors, Fumes, Dusts and Mists.
10. 29 CFR Part 1926.57 – Ventilation.
11. 29 CFR Part 1926.62 – Lead (Construction Industry Standard).
12. 40 CFR Part 260 – Hazardous Waste Management Systems: General.
13. 40 CFR Part 261 – Identification and Listing of Hazardous Waste.
14. 40 CFR Part 262 – Generators of Hazardous Wastes.
15. 40 CFR Part 263 – Transporters of Hazardous Waste.
16. 40 CFR Part 264 – Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.
17. 40 CFR Part 265 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.
18. 40 CFR Part 268 – Land Disposal Restrictions.
19. 40 CFR Part 745 – Lead; Requirements for Lead-Based Paint Activities in Child Occupied Facilities
20. 49 CFR Parts 170-178 – Department of Transportation Regulations.
21. New York Codes of Rules and Regulations (NYCRR)
 - a. 6 NYCRR Part 360 – Solid Waste Regulations.
 - b. 6 NYCRR Part 364 – Waste Transporter Permits.
 - c. 6 NYCRR Part 370-373 – Hazardous Waste Regulations.
22. Steel Structures Painting Council (SSPC)
 - a. SSPC-Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations.
 - b. SSPC-Guide 7 – Guide for the Disposal of Lead-Contaminated Surface Preparation Debris.
23. Underwriters Laboratories, Inc. (UL)
 - a. UL 586 – High Efficiency, Particulate Air Filter Units.

1.03 QUALITY ASSURANCE

The Contractor's Competent Person is required to maintain a copy of the following documents on-site:

A. Qualifications

1. Contractor: Documentation that the Contractor has prior experience on LBP and LCP activity projects similar in nature and extent to ensure the capability to perform the required work procedures in a satisfactory manner.
2. Competent Person: Certification that the Contractor's full-time on-site Competent Person meets the Competent Person requirements of 29 CFR Part 1926.62 and is experienced in administration and supervision of LBP and LCP activity projects, including work practices, protective measures for building and personnel, disposal procedures, etc. The Competent Person shall also be the project Supervisor.
3. Contractor's Testing Laboratory: Documentation that the laboratory performing the OSHA personal sample analysis is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is listed proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT) and is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. Certification shall include accreditation for heavy metal analysis, and a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors. Documentation shall include the date of accreditation or reaccreditation.
4. Blood Lead Testing Laboratory: Adequate documentation that the laboratory is certified to perform blood lead analysis for the State where the work site is located.

B. Respiratory Protection Devices

Manufacturer's NIOSH certification for respiratory protection devices utilized on the site.

C. Cartridges, Filters, and Vacuum Systems

Manufacturer's NIOSH certification of approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate); High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges, filters, and HEPA vacuum systems.

D. Medical Examination and Records

1. Certification that employees who are involved in LBP and LCP work have received medical examinations and will receive continued medical surveillance, including blood lead level monitoring, as required by 29 CFR Part 1926.62, 29 CFR Part 910.1200, 29 CFR Part 1910.120 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor expense, in accordance with 29 CFR Part 1910.20.
2. Provide medical surveillance to workers until exposure monitoring reveals that workers are not exposed to airborne lead at or above the Action Level of 30 ug/m³. This consists of a blood test measuring the level of lead and zinc protoporphyrin by a licensed physician. Further testing and medical exams may be necessary depending on the results of initial blood tests and/or the initial exposure assessment.

E. Training

Training certification shall be maintained and posted at the site, prior to the start of work involving LBP and LCP work, for all of the Contractors' workers, supervisors and Competent Person. Training meet the requirements of 29 CFR Part 1926.62, 29 CFR Part 1926.59, 29 CFR Part 1910.1200 and 49 CFR 172. Training shall be provided prior to the time of job assignment and as required by the regulations thereafter. The specific training project shall, at a minimum, include the following.

1. Lead Paint Awareness Training as per 29 CFR 1926.62.
2. Specific nature of the operation, which could result in exposure to lead.
3. Purpose, proper selection, fitting, use and limitations of respirators.

4. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females, hazards to the fetus and additional precautions for employees who are pregnant).
5. Relevant engineering controls and good work practices.
6. The contents of any compliance plan in effect.
7. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
8. The employee's right of access to records under 29 CFR part 1910.20.

F. Respiratory Protection Program

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 12 months thereafter as required by 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
2. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
3. All workers are required to don respirator(s) with the appropriate level of protection commensurate with the airborne concentrations of lead in which they are working. The level of protection will be determined by the Contractor, based on objective air monitoring data.

1.04 ON-SITE SUBMITTALS

The Contractor's Competent Person is required to maintain a copy of the following documents on-site:

A. Certifications

Prior to the start of work, maintain the on-site, required certifications and licenses listed above in Section 1.03.

B. Equipment List

Maintain a list of equipment items to be used in the work, including brand names, model, capacity, performance characteristics, quantities, and other pertinent information.

C. LBP and LCP Safe Work Practice Compliance Plan

The contractor shall prepare a detailed LBP and LCP Safe Work Practice Compliance Plan that identifies the work procedures, health and safety measures to be used in LBP and LCP work procedures; and that addresses spill prevention, containment, and emergency response procedures. The Plan shall be maintained on-site. The plan shall address the methods to be undertaken during LBP and LCP disturbances to include all requirements of 1926.62(e)(2)(ii) including, but not limited to the following key elements:

1. LBP and LCP containment methods to control employee exposure to lead at or below the permissible exposure limit.
2. Training requirements as required by Federal, State, and Local regulations.
3. Unique problems associated with the LBP and LCP project.

4. Sketch of location and details of LBP and LCP control areas, decontamination procedures. Refer to the Standard Specification for the Identification and Disposal of Hazardous Waste 028600 for waste storage area requirements.
5. Eating, drinking, smoking, and restroom procedures.
6. Sequencing of LBP and LCP related work.
7. Personal protective equipment and respiratory protection program, including controls.
8. Engineering controls, containment structures and safety measures. Refer to 1.07, D of this Section for HEPA filtered negative air unit requirements, as applicable.
9. Worker exposure assessment procedures.
10. Work Practice controls.
11. Housekeeping.
12. Hygiene facilities and practice.
13. Medical surveillance, including medical removal procedures.
14. Sampling, testing and analytical methods for personal air sampling requirements of 29 CFR Part 1926.62. Procedures must include frequency, locations, sampling, and analytical methods to be used.
15. Contractor to include the segregation and minimization of lead waste streams from construction and demolition waste in their lead-based paint management plan.
16. Visual clearance log for each control area that is maintained by the Contractor's Competent Person.

D. Compliance Program

Contractor's Compliance Program prepared in accordance with 29 CFR Part 1926.62 (e) (2) shall be maintained on-site.

E. Sampling and Laboratory Analysis Reports

Maintain on-site all field sampling logs for all personal air samples taken, including copies of laboratory analysis reports and chain of custody records for all sample analyses.

F. Competent Person certification per Sections 1.02 and 1.03.

1.05 CLOSEOUT SUBMITTALS: At the conclusion of the LBP/LCP project, the Contractor shall provide the following closeout submittals:

1. Submit copies of all "Visual Clearance Logs" to the Project Manager for owner's reference.
2. Signed Certification from the Contractor's Competent Person that all required documentation has been provided.

1.06 POSTED WARNINGS & NOTICES

The following regulations, warnings and notices shall be posted at the work site in accordance with 29 CFR Part 1926.62.

A. Regulations

A copy of applicable Federal, State, and Local regulations shall be maintained at the work site.

B. Warning Signs

Warning signs shall be provided at approaches to LBP/LCP control areas. Signs shall be located at a distance from the LBP and LCP control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the LBP/LCP control area. The signs shall comply with the requirements of 29 CFR Part 1926.62.

C. Worker Information

Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, State and Local regulations.

D. Exposure Air Monitoring Results

Exposure air monitoring results shall be prepared in order to be easily understood by the workers and shall be placed in a clearly visible area of the work site.

E. Emergency Telephone Numbers

A list of telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor representatives who can be reached 24 hours per day as well as professional consultants directly involved in the project.

1.07 EQUIPMENT & MATERIALS

Enough health and safety materials required by 29 CFR Part 1926.62, and other materials and equipment needed to complete the project, shall be available and kept on the site.

A. Respirators

Air-purifying respirators shall be approved by NIOSH for use with dust, fumes and mists having permissible exposure limits of less than 0.05 milligrams per cubic meter (i.e. have high-efficiency particulate air [HEPA] filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. The Contractor shall furnish, at no cost to personnel/employees, respirators to provide protection from airborne concentrations of lead. Respirators shall comply with the requirements of 29 CFR Part 1926.62 and shall be used in accordance with 29 CFR Part 1926.62, 29 CFR Part 1926.103 and 29 CFR Part 1910.134.

B. Respirator Cartridges

A sufficient supply of respirator cartridges shall be maintained at the work site to provide new cartridges to employees and authorized visitors throughout the duration of the project. Cartridges shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the cartridges become wet.

C. Protective Clothing

1. The Contractor shall furnish, at no cost to personnel/employee, equipment/ clothing for protection from airborne and waterborne LBP and LCP debris. An adequate supply of these items shall be available for worker and authorized visitor use. Workers and visitors shall not take protective clothing and equipment off the work site at any time. Protective clothing includes:

a. Coveralls (Whole Body Protective Coverings): Full-body coveralls and head covers shall be worn by workers in the control area as necessary. Sleeves shall be secured at the wrist and pants legs at the ankle with tape. Permeable clothing shall

be provided in heat-stress conditions. Where non-disposable coveralls are provided, these coveralls shall be cleaned after each wearing and kept within the control area or decon/airlock (bagged). Cleaning of coveralls and other non-disposable clothing shall be in accordance with the provisions for cleaning in 29 CFR Part 1926.62.

- b. Boots: Work boots with nonskid soles or impermeable work boot covers shall be worn by workers. Where required by OSHA, safety boots (steel toe or steel toe and shank) shall be worn. Paint the uppers of boots red with waterproof enamel. Do not allow boots to be removed from the control area for any reason after being contaminated with LBP or LCP debris. Keep within control area or decon/airlock (bagged).
- c. Gloves: Inner gloves, appropriate for items and hazards encountered, and disposable outer work gloves shall be provided to each worker and shall be worn while the worker is in the control area. Glove materials should be appropriate for specific chemical exposure. Gloves shall not be removed from the control area and shall be disposed of as LBP or LCP contaminated waste at the end of the work.
- d. Hard Hats: Head protection (hard hats) shall be provided as required by OSHA for workers and authorized visitors. Protective plastic-strap suspension hats shall be used. Hard hats shall be always worn when work is in progress. Hard hats shall remain in the control area until the project is completed. Hard hats shall be thoroughly cleaned, decontaminated, dried and bagged before being removed from the control area at the end of the project.
- e. Eye Protection: Fog-proof goggles for personnel engaged in LBP and LCP operations shall be worn when the use of a full-face piece respirator is not required and kept within control area or decon/airlock (bagged) until completion of project.

D. Negative Air Pressure System

When a LBP or LCP control area requires the use of an airtight containment barrier, a negative air pressure system shall be used and pressure differential recordings taken. LBP and LCP shall not be removed from the LBP/LCP control area until the proper engineering controls and HEPA filtration systems are in place.

1. HEPA Filter Requirements

The negative air pressure system shall be equipped with approved HEPA filters per UL 586. Negative air pressure equipment shall be equipped with new HEPA filters and shall be sufficient to maintain a minimum pressure differential of minus 5 Pascals (Pa), equivalent to 0.02 inch of water column relative to adjacent, unsealed areas. Negative air pressure system minimum requirements are listed below.

- a. The unit shall be capable of delivering its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place. The units shall be clean and sealed (intake & exhaust) at all times when not operating in a control area.
- b. The HEPA filter shall be certified as being capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. 700 hours is the manufacturer life recommendation of a HEPA filter (approximately 1 month of continuous operating).

- c. The unit shall be capable of delivering no less than 70 percent of rated capacity when the HEPA filter is 70 percent full or measures 620 Pa (2.5 inches of water) static pressure differential on a magnehelic gauge.
- d. The unit shall be equipped with a manometer-type negative pressure differential monitor with a minor scale division of 0.02 inches of water and accuracy within plus or minus 1.0 percent. The manometer shall be calibrated in accordance with the manufacturer's recommendations. Record manually manometer readings of the pressure differential between the LBP control area and adjacent unsealed areas at the beginning and end of each workday.
- e. The unit shall be equipped with a means for the operator to easily interpret the readings in terms of the volumetric flow rate of air per minute moving through the machine at any given moment.
- f. The unit shall be equipped with an electronic mechanism that automatically shuts the machine off in the event of a filter breach or absence of a filter.
- g. The unit shall be equipped with an audible horn that sounds an alarm when the machine has shut itself off.
- h. The unit shall be equipped with an automatic safety mechanism that prevents a worker from improperly inserting the main HEPA filter.
- i. The unit shall be ducted through the containment barrier wall to the exterior of the building. The unit shall not be exhausted into any interior areas. If exhausting to the exterior is not feasible, utilize an unoccupied area or room that is large enough to handle the volume of air with two units connected in series. Applicable warning signage shall be posted at this location. Owner's prior approval is required if exhausting into the interior of the building.

2. Number of Units Required

The air within the containment barrier shall be changed at least once every 15 minutes by a continuously operating negative air pressure system, until the LBP/LCP control area barrier is removed. Filters shall be replaced as necessary to maintain the efficiency of the system. A back-up unit shall be maintained on-site.

3. Auxiliary Generator

If site conditions can't provide power, an auxiliary generator shall be provided. The generator shall not present a carbon monoxide hazard to workers.

4. Discontinuing Negative Air Pressure System

The negative air pressure system shall not be shut down during LBP/LCP work unless authorized by the owner's third-party environmental consultant. At the completion of the LBP/LCP work procedures and disposal project, units shall be run until the removal is completed satisfactorily and full cleanup has been completed and satisfactory clearance has been achieved. Dismantling of the negative air pressure systems shall conform to the written decontamination procedures. Prefilters shall be removed and properly disposed. The intake and exhaust of the machines shall be sealed with polyethylene to prevent environmental contamination.

E. Expendable Materials

1. Polyethylene Sheet and Bags - General

Polyethylene sheet and bags shall be minimum 6-mil thick. Bags shall have pre-printed labels, and 5-inch (minimum) long plastic ties, pointed and looped to secure the filled bags. Polyethylene sheets shall be in roll sizes to minimize seams.

2. Polyethylene Sheet - Flame Resistant

Where a potential for fire exists, flame-resistant polyethylene sheets shall be provided. Polyethylene film shall conform to the requirements of NFPA 701.

3. Polyethylene Sheet - Reinforced

Reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the LBP control area and the indoor and outdoor environments. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Films meet flame resistant standards of NFPA 701.

4. Tape and Adhesive Spray

Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.

5. Containers

DOT approved impermeable containers shall be used to receive and retain LBP and LCP waste and debris and lead contaminated material until disposal. Containers shall be labeled in accordance with EPA, DOT and OSHA standards, as applicable for the type of waste. Waste streams shall be segregated in a manner to reduce the potential volume of hazardous waste generated.

6. Chemicals

Chemicals, including caustics and paint strippers, shall be properly labeled, stored in leak-tight containers and properly/safely secured from the general public.

F. Vacuum Systems

HEPA filtered vacuum systems shall be used during LBP/LCP operations which generate dust. The systems shall be suitable for the project, and filters shall be capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. Vacuum opening, wands and hoses shall be sealed at all times when not in a control area.

G. Chemical Paint Strippers

Chemical paint strippers shall contain no methylene chloride.

H. Chemical Paint Stripper Neutralizer

Neutralizers for paint strippers shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

I. Storage of Materials

Materials shall be stored in an approved enclosed structure, which protects them from damage, rain, wind, etc. and contamination. During periods of cold weather, plastic materials shall be protected from the cold. Regularly inspect materials to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Store materials shall not present a hazard or an inconvenience to workers, visitors, employees and/or other building occupants.

PART 2 – EXECUTION

2.01 WORK PROCEDURES

LBP and LCP work procedures and related work shall be performed in accordance with the accepted Contractor's LBP and LCP Safe Work Practice Compliance Plan, 29 CFR Part 1926.62 and as specified herein. LBP/LCP waste and debris, lead contaminated debris and personal protective clothing and equipment shall be disposed of in compliance with Federal, State, and Local regulations and in accordance with the respective waste stream TCLP testing results.

A. Personal Protection Procedures

Respiratory Protection is required for all LBP disturbances. Personnel shall wear and use protective clothing and equipment as specified and required by 29 CFR Part 1926.62 and 29 CFR Part 1910.120. Eating, smoking, drinking, chewing tobacco, chewing gum, applying makeup and use of non-work-related walkie-talkies/phones shall not be permitted in the LBP and LCP control area. Personnel of trades not engaged in the LBP or LCP work procedures and disposal of LBP and LCP shall not be exposed at any time to airborne concentrations of lead equal to or in excess of 30 micrograms per cubic meter of air (30 ug/m³). Electrical service shall be disconnected when wet removal is performed, and temporary electrical service protected by a ground fault circuit interrupter (GFCI) shall be provided.

B. Safety and Health Procedures

The Competent Person shall be present on the work site throughout the LBP and LCP project to supervise, monitor and document the project's health and safety provisions. A daily log shall be maintained showing the results of air sampling tests throughout the project area. LBP and LCP work being conducted within a LBP or LCP control area where an airtight barrier is required shall be stopped if measured airborne lead concentrations, collected during LBP or LCP work procedures, exceed the Action Level.

C. Safety and Health Responsibilities

The Competent Person shall:

1. Verify that training meets applicable requirements.
2. Review and approve LBP/LCP Safe Work Practice Compliance Plan for conformance to the applicable referenced standards.
3. Inspect LBP and LCP removal work for conformance with the accepted Safe Work Practice Compliance Plan.
4. Ensure that worker exposure air monitoring activities are in accordance with 29 CFR Part 1926.62.
5. Ensure work is performed in strict accordance with specifications.
6. Ensure hazardous exposure to personnel and to the environment are adequately controlled.
7. The Contractor's Competent Person shall be responsible for directing personal air monitoring and shall also perform visual inspections prior to the visual inspection conducted by owner's third-Party Environmental Consultant (if applicable), to verify the control areas are free of all visible debris.

8. If required, the Contractor's Competent Person shall coordinate with the owner's third-party environmental consultant for any control areas requiring final air/wipe testing clearance testing (Action Level/wipe) in accordance with OSHA and/or US Department of Housing and Urban Development (HUD) protocols.

D. Medical Surveillance Procedures

Medical surveillance shall be implemented in accordance with the accepted Contractor's LBP/LCP Safe Work Practice Compliance Plan and shall comply with the requirements of 29 CFR Part 1926.62, including the provisions for blood lead monitoring, medical removal, protection and a physician's written opinion, signed by the physician performing the employee examination. The Contractor's Competent Person shall maintain on-site, a copy of the written opinion for Contractor's employees prior to each employee's commencement of work.

E. Engineering Controls and Containment Structures

Engineering and work practice controls are the primary means of maintaining exposures to lead below the PEL. Paint removal and surface preparation activities must keep dust levels at a minimum. Power tools must be equipped with manufacturer equipped vacuum shrouds including an attached HEPA filtered vacuum system.

1. LBP/LCP Control Area

The control area is where LBP/LCP work procedures occur and as such shall be considered contaminated. The LBP/LCP control area shall be isolated to prevent LBP/LCP containing dust or debris from passing into adjacent areas. The control area shall be decontaminated at the completion of the LBP/LCP work procedures and disposal work.

2. Boundary Requirements.

Physical boundaries along with Warning Signage shall be provided around exterior LBP/LCP control areas by taping off the area indicated in the Safe Work Practice Compliance Plan.

3. Control Barriers

The LBP/LCP control area shall be designated and separated from other outside areas with control barriers. The polyethylene sheeting shall mask and seal all openings. The LBP/LCP control area shall be erected according to the Contractors LBP/LCP Safe Work Practice Compliance Plan. Polyethylene sheeting shall be mechanically supported, independent of duct tape or spray adhesive.

4. Exterior Masking and Sealing

Exterior LBP/LCP control area requirements: Where the construction of a contained LBP/LCP control area is impractical or not required based on the method of lead work procedures, a taped-off perimeter shall be installed around the area where the LBP/LCP handling procedures are performed and other requirements for LBP/LCP control areas shall be maintained. Personal monitoring of airborne concentrations is still required and shall be conducted in accordance with 29 CFR Part 1926.62.

5. Hand Wash Station

An operational hand washing station shall be provided to all workers adjacent to each LBP/LCP control area utilizing polyethylene sheeting as a drop cloth. Water shall be hot and cold or warm. Soap dishes, continuing supply of soap, and clean towels shall be provided. The hand washing station shall be maintained in a sanitary condition. Wastewater shall be collected and placed within 6-mil polyethylene bags and sealed. Bags shall be immediately placed within non-leaking, drums and sealed.

6. Equipment Decontamination

An equipment decontamination area shall be installed at the entrance to each LBP/LCP control area to allow for the cleaning of all equipment utilized on the project. Polyethylene sheeting shall be utilized as a drop cloth, along with a utility tub to clean and capture debris/water during the cleaning process. Water shall be hot and cold or warm. Continuing supply of detergent, and clean towels shall be provided. The equipment decontamination area shall be maintained in a sanitary condition. Wastewater shall be collected and placed within 6-mil polyethylene bags and sealed. Bags shall be immediately placed within non-leaking, drums and sealed.

F. Temporary Utilities

1. Temporary equipment as necessary to provide adequate power, light, heat, and water shall be installed, as needed, to accomplish the LBP/LCP operations properly and safely. The Contractor shall maintain the security and maintenance of the utility system in the LBP/LCP control areas. In the event of a failure of any utility system, the Owner will not be responsible for any loss of time or other expenses incurred by the Contractor. In addition to any site-specific temporary utility requirements, the Contractor shall provide:
 - a. Back-flow protection on all water connections. Fittings installed by the Contractor shall be removed after completion of work with no damage or alteration to existing water piping and equipment.
 - b. When applicable, heavy-duty abrasion-resistant hoses provide water to each control area and decontamination area.
 - c. A hot water heater, if necessary, to provide warm water to the decontamination showers, hand wash station and equipment decontamination area.
 - d. Electrical service to control areas. Electrical service shall comply with the National Electric Code, State and Local requirements and UL standards. Warning signs shall be posted at power outlets, which are other than 110–120-volt power. Only grounded extension cords connected into a GFCI shall be used. Incandescent lamps and light fixtures shall be of adequate wattage to provide good lighting in LBP/LCP control areas.
 - e. Temporary heating units, when needed, that have been tested and labeled by UL, FM, or another recognized trade association related to the fuel being consumed. Forced air or fan type units shall not be utilized inside a control area. Units shall have tip-over protection.

2.02 LEAD-BASED/CONTAINING PAINT WORK PRACTICES (Use methods as applicable)

A. Component Removal:

Components shall be removed intact to the extent practicable. A 6-mil polyethylene drop cloth shall be placed around and/or beneath the component, prior to its removal, to catch any paint chips that may become dislodged. The component shall be wrapped and sealed in a layer of clear 6-mil polyethylene prior to movement to the disposal container. Follow proper disposal requirements. The area around the component removal shall be wet wiped and HEPA vacuumed. The polyethylene sheeting shall be carefully folded in on itself and placed in a 6-mil disposal bag. Containment debris shall be properly stored in accordance with the respective waste stream as per the Contractor's LBP/LCP Safe Work Practice Compliance Plan

B. Chemical Stripping:

Chemical stripping may be used for LBP and LCP removal on surfaces that will be subjected to welding, cutting, torch burning or where it is the only acceptable procedure. No chemical strippers or associated neutralizer chemicals containing methylene chloride shall be used by the Contractor on this project.

1. Horizontal surfaces directly below and in a radial direction from the area where chemical stripping is to be performed shall be covered with 6-mil plastic sheeting and shall also extend ten (10) feet on either side of the control area or to the furthest practical distance to catch any paint chips that may become dislodged.
2. All LBP/LCP on specified surfaces shall be removed to the bare substrate. The job is not considered complete until the substrate is dry, free of paint, debris, and LBP/LCP residue.
3. LBP/LCP stripping agents shall be brushed or troweled on the designated surfaces or otherwise applied to a minimum thickness in accordance with manufacturer's specifications.
4. The required application/reaction time for stripping will depend upon the ambient temperature, humidity, and thickness of LBP/LCP. If LBP/LCP is not completely removed following the initial application of stripper, additional applications and wet scrapings may be required.
5. Removed LBP/LCP shall not be deposited on the polyethylene containment surfaces but shall be transferred directly into clear 6-mil polyethylene bags from the scraper and sealed. LBP/LCP shall be removed by wet scraping to the maximum extent feasible. If the substrate is to be reused, the removal activities shall not damage the substrate.
6. Any residue not removable by wet scraping shall be washed down to the bare metal substrate with an appropriate, pre-approved solution. LBP/LCP-contaminated wastewater shall be kept to a minimum using wet scrub brushes or sponges. These residues and disposable cleaning media shall also be directly transferred to 6-mil polyethylene bags and sealed. Bags shall be immediately placed within non-leaking, drums and sealed. Free standing water shall be eliminated by use of a drying agent. Contractor to include the segregation and minimization of lead waste from construction and demolition waste in their LBP/LCP Safe Work Practice Compliance Plan.

C. Manual Demolition/Scraping/Cleaning:

1. Manual demolition, scraping, sanding and power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).
2. Seal openings of HVAC ductwork and other penetrations (doors, windows, etc.) within the Control Area with two layers of 6-mil polyethylene sheeting. For work on vertical surfaces, place a layer of 6-mil polyethylene sheeting below the area prior to manual demolition/scraping/sanding/cleaning. The sheeting shall extend ten (10) feet on either side of the control area or to the furthest practical distance to catch any paint chips that may become dislodged.
3. Wet methods shall be used during manual scraping, sanding and power tool cleaning with dust collection systems. Local HEPA ventilation shall be utilized in conjunction with manual scraping, sanding and power tool cleaning with dust collection systems. In the case that local HEPA ventilation is not sufficient to control dust hazards, the Contractor shall be required to install engineering controls to meet requirements of specification section 1.06, D., "Negative Air Pressure System".
4. Removed LBP/LCP shall not be allowed to accumulate on surfaces within the Control Area but shall be HEPA vacuumed or placed directly into 6-mil polyethylene bags. The Contractor shall maintain all surfaces as free as practicable of accumulated lead

dust to prevent the dispersal of lead into the work places that are outside of the lead paint control areas. LBP/LCP shall be removed by manual methods to the maximum extent feasible.

5. Debris shall be bagged in 6-mil polyethylene bags, sealed, and secured in leak proof drums. The area around the surfaces subject to work shall be wet wiped and HEPA vacuumed, including the polyethylene sheeting. Upon a satisfactory clearance inspection by the owner's Third-Party Environmental Consultant (if applicable) and the Contractor's Competent Person, the cleaned polyethylene sheeting shall be carefully folded in on itself and placed in a 6-mil disposal bag. Containment debris shall be properly stored in accordance with the respective waste stream as indicated in the contractor's LBP/LCP Safe Work Practice Compliance Plan. The contractor shall coordinate with the owner's third-party environmental consultant to test the waste streams for disposal.

D. Alternative Lead Work Procedures

1. Any work procedure deviating from the outlined procedures above shall be submitted to Hunt-EAS Design Team and the Owner's third-party Environmental Consultant for review and approval prior to the start of the project. As there are many different components in different areas of the building(s), it is impractical to address every potential work procedure. The intent of alternative lead work procedures shall be to maintain compliance with 29 CFR 1926.62 and maintain airborne concentrations of lead dust below the Action Level of 30 ug/m^3 .

2.03 PERSONAL AIR MONITORING, WASTE SAMPLING & CLEARANCE SAMPLING

During all LBP/LCP removal and disposal operations, the Contractor's OSHA Competent Person shall be on-site inspecting the work to ensure that the health and safety requirements of this contract are satisfied. The building Owner may elect to have a Third-Party Environmental Consultant on-site to perform visual clearance inspections and/or clearance sampling.

A. Personal Air Monitoring (Provided by the Contractor, as necessary)

1. Personal air monitoring samples for airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR Part 1926.62. Results shall be reported in micrograms per cubic meter of air. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls, the adequacy of PPE and to determine if proper work practices are being employed. The owner's third-party environmental consultant shall be notified if any personal air monitoring result meets or exceeds 30 ug/m^3 of air. The Contractor shall stop work and take steps to reduce the concentration of lead in the air. Such corrective actions shall be documented in the daily log. Personal air sampling results shall be verbally available within 24-hours of sampling with hard copy reports available within five (5) calendar days of sampling.

B. Waste Sampling and Testing's Third-Party Environmental Consultant

1. Sampling and testing of all waste streams shall be in accordance with 40 CFR Part 261, 6 NYCRR Part 371 and SW-846, Chapter 9, Sampling Plan. See Paragraph 2.05 C. of this specification section for waste sampling and analyses requirements.

C. Dust/Wipe Sampling owner's Third-Party Environmental Consultant).

1. Dust/wipe samples shall be taken after clean-up activities have been completed and the control areas passed a visual inspection. Refer to Section 2.01 C. 7. for visual inspection requirements.

2. Sampling for clearance criteria shall be performed in compliance with HUD Guidance document.
3. If clearance fails, the recleaning and any additional costs (dust/wipe sample analyses, etc.) to clear the control area shall be the responsibility of the Contractor. The control area shall remain in place until satisfactory clearance has been achieved.
4. Clearance Levels:
 - a. Floors: 10 ug/ft²
 - b. Windowsills: 50 ug/ft²
 - c. Window Wells: 100 ug/ft²

2.04 ADJACENT AREAS

Damage to adjacent areas shall be repaired by the Contractor to the approval of the Owner.

2.05 CLEAN-UP & DISPOSAL

A. Cleanup

1. Daily:

Surfaces in the LBP/LCP control area shall be maintained free of accumulations of paint chips, LBP/LCP debris and dust. Spread of dust and debris shall be restricted; waste shall not be distributed over the control area. Dry sweeping or compressed air shall not be used for cleanup. At the end of each shift, the area shall be cleaned of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet wiping the area. LBP/LCP work procedures shall cease during the cleanup.
2. At completion of LBP/LCP work and a satisfactory visual inspection by owner's Third-Party Environmental Consultant (if applicable) and OSHA Competent Person, a clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the control area. The polyethylene sheeting shall be sprayed or misted with water for dust control, construction debris removed and polyethylene sheeting wet wiped. Then the sheeting shall be removed by folding it in upon itself.
 - a. Lead-contaminated debris shall be containerized in accordance with the Contractor's LBP/LCP Safe Work Practice Compliance Plan. Waste bags shall not be overloaded and shall be securely sealed and stored in the designated area.
 - b. Removal of surface polyethylene sheeting shall begin from top to bottom. Removal of floor polyethylene sheeting shall begin at the corners and fold in the middle to contain the dust. Polyethylene shall be disposed of as per the Contractor's LBP/LCP Safe Work Practice Compliance Plan Cleaning Equipment. The Contractor shall decontaminate the lead abatement equipment and equipment used in the control area. The wastewater from cleaning shall be contained, sampled and disposed of as specified within Section 2.01 E. 6. and 2.02 B. 7 *and as per contractor's LBP/LCP Safe Work Practice Compliance Plan.*

B. Certification

1. The Contractor's Competent Person shall certify and sign within the log that the respiratory protection for the employees was adequate, the work procedures were performed in accordance with 29 CFR Part 1926.62 and that there was no visible accumulations of LBP/LCP paint/coating or dust on the worksite. Do not remove

warning signs at the lead control area or roped-off boundary signs prior to the completion of the Competent Person's signed certification. If applicable, the Contractor's Competent Person's certification shall be forwarded to the owners Project Manager, Third Party Environmental Consultant's for review prior to removing warning signs at the lead control area or roped-off boundary signs.

END OF SECTION 02 83 10

Appendix A: LBP and LCP Survey Report Documentation Summary:

For Details, refer to the Environmental Survey Report Included as Part of this Project Manual.

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR:

Inspection Date: 11/18/11
 Report Date: 11/21/2011
 Abatement Level: 1.0
 Report No. 11/18/11 09:40
 Total Readings: 475 Actionable: 29
 Job Started: 11/18/11 09:40
 Job Finished: 11/21/11 18:17

Corning West High

Reading No.	Wall	Structure	Location	Member	Paint Cond	Substrate	Color	Lead (mg/cm ²)	Mode
Interior Room 003 507									
034	A	column	Lft		I	Steel	white	1.8	QM
Interior Room 009 501A									
081	A	Wall	Rgt		I	ceramic	L. green	9.9	QM
079	B	Wall	Ctr		I	ceramic	L. green	9.9	QM
080	D	Wall	Ctr		I	ceramic	L. green	9.9	QM
Interior Room 014 men 202									
130	C	Ceiling	Ctr		I	Steel	tan	1.0	QM
Interior Room 017 boys 315									
162	C	column	Rgt		I	Steel	white	1.0	QM
Interior Room 019 corr 500									
169	A	Wall	Rgt	tile	I	ceramic	L. green	9.9	QM
170	C	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
Interior Room 021 105									
208	A	column	Lft		F	Steel	white	1.0	QM
Interior Room 023 630									
221	B	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
Interior Room 024 631									
230	A	Support beam	Rgt		I	Steel	black	1.0	QM
Interior Room 029 Mech 69C									
265	B	Motor	Lft	support	I	Steel	red	1.0	QM
Interior Room 030 609									
276	A	conduit	Rgt		I	Metal	white	1.0	Std
Interior Room 031 612									
286	A	basecove	Ctr		I	Vinyl	black	3.1	QM
Interior Room 033 616									
314	A	basecove	Ctr		I	Vinyl	black	4.5	QM
318	A	Support beam	Ctr		I	Steel	black	1.0	QM
Interior Room 034 mens 600E									
322	A	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
323	C	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
324	D	Wall	Lft	tile	I	ceramic	L. green	9.9	QM
Interior Room 037 corr 600									
356	B	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
355	D	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM

Comment: tile positive are 2x2.neg tile are 4x4.

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR:

Reading No.	Wall	Structure	Location	Member	Paint Cond	Substrate	Color	Lead (mg/cm ²)	Mode
Interior Room 043 810A									
427	A	Wall	L Ctr		I	ceramic	pink	9.9	QM
429	C	Wall	L Ctr		I	ceramic	pink	9.9	QM
428	D	Wall	L Ctr		I	ceramic	pink	9.9	QM
Comment: tile on wall 4x4.									
Interior Room 044 814									
446	B	Ceiling	Lft	deck	I	Steel	white	1.0	QM
Interior Room 046 womens 814									
458	A	Wall	Ctr	tile	I	ceramic	Blue	9.9	QM
459	C	Wall	Rgt	tile	I	ceramic	Blue	9.9	QM
Comment: wall tile blue 4x9.cream tile 4x4.									
Interior Room 047 corr 800									
463	B	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
464	D	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM
Comment: positive wall tile 2x2. neg. 4x4.									
Calibration Readings									
---- End of Readings ----									

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR:

Inspection Date: 11/18/11
 Report Date: 11/19/2011
 Abatement Level: 1.0
 Report No. 11/18/11 09:40
 Total Readings: 188 Actionable: 8
 Job Started: 11/18/11 09:40
 Job Finished: 11/18/11 16:11

Corning West High

Reading No.	Wall	Structure	Location	Member	Paint Cond	Substrate	Color	Lead (mg/cm ²)	Mode
Interior Room 003 507									
034	A	column	Lft		I	Steel	white	1.8	QM
Interior Room 009 501A									
081	A	Wall	Rgt		I	ceramic	L. green	9.9	QM
079	B	Wall	Ctr		I	ceramic	L. green	9.9	QM
080	D	Wall	Ctr		I	ceramic	L. green	9.9	QM
Interior Room 014 men 202									
130	C	Ceiling	Ctr		I	Steel	tan	1.0	QM
Interior Room 017 boys 315									
162	C	column	Rgt		I	Steel	white	1.0	QM
Interior Room 019 corr 500									
169	A	Wall	Rgt	tile	I	ceramic	L. green	9.9	QM
170	C	Wall	Ctr	tile	I	ceramic	L. green	9.9	QM

Calibration Readings

----- End of Readings -----

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR:

Inspection Date: 11/28/11
 Report Date: 12/3/2011
 Abatement Level: 1.0
 Report No. 11/28/11 10:52
 Total Readings: 453 Actionable: 26
 Job Started: 11/28/11 10:52
 Job Finished: 11/29/11 15:49

Corning West High

Reading No.	Wall	Structure	Location	Member	Paint Cond	Substrate	Color	Lead (mg/cm ²)	Mode
Exterior Room 004 Roof									
099	B	ladder	Ctr		P	Metal	Green	1.0	Std
		to upper aux gym.							
Exterior Room 005 School									
144	B	hand rail	Ctr		F	Metal	Green	1.0	Std
147	B	hand rail	Ctr		P	Metal	Green	1.0	QM
148	B	Overhang	Ctr	ceiling	F	Metal	brown	1.0	Std
111	C	Overhd door	Rgt	lental	P	Steel	pink	2.6	QM
124	C	Window	Lft	casing	I	Steel	Green	9.9	QM
125	C	Window	Lft	lental	I	Steel	Green	9.9	QM
127	D	fascia	Rgt		I	Metal	brown	1.0	QM
Interior Room 001 Boiler Rm									
010	A	conduit	Rgt		F	Metal	white	1.0	Std
		small conduit							
046	C	water soften	Lft	valve	F	Metal	Green	3.3	QM
Interior Room 002 110A									
087	A	ladder	Lft		I	Metal	black	1.0	QM
		roof access							
Interior Room 007 Kitchen									
174	A	Wall	Ctr		I	Glaze bloc	tan	2.5	QM
172	C	Wall	Ctr		I	Glaze bloc	tan	2.2	QM
173	D	Wall	Lft		I	Glaze bloc	tan	2.5	QM
Interior Room 014 101									
204	C	Door	Lft	Lft casing	I	Metal	Green	1.0	QM
Interior Room 017 103F bath									
219	A	Wall	L Ctr	4x4 tile	I	ceramic	Peach	9.9	QM
218	C	Wall	L Ctr	4x4 tile	I	ceramic	Peach	9.9	QM
Interior Room 023 corr 100									
261	A	Vent	Ctr		I	Metal	Green	1.0	QM
250	A	Wall	Ctr	2x2 tile	I	ceramic	Green	9.9	QM
Interior Room 024 mech. gym									
272	D	ladder	Ctr		F	Metal	tan	1.0	QM
Interior Room 033 pool									
349	A	Floor	Rgt	drain	I	Metal	gray	9.9	Std
342	C	Window	Rgt	lental	P	Steel	L. green	9.9	QM
Interior Room 034 676									
352	D	basecove	Ctr		I	Vinyl	black	2.5	QM
Interior Room 045 514C									
415	D	Floor	Ctr	drain	I	Metal	Silver	1.6	QM

SUMMARY REPORT OF LEAD PAINT INSPECTION FOR:

Reading No.	Wall	Structure	Location	Member	Paint Cond	Substrate	Color	Lead (mg/cm ²)	Mode
Interior Room 048 312									
429	D	ladder	Lft		F	Metal	black	1.0	Std
Interior Room 049 stair 600B									
434	A	Wall	Ctr	2x2 tile	I	ceramic	Green	8.7	QM
Calibration Readings									

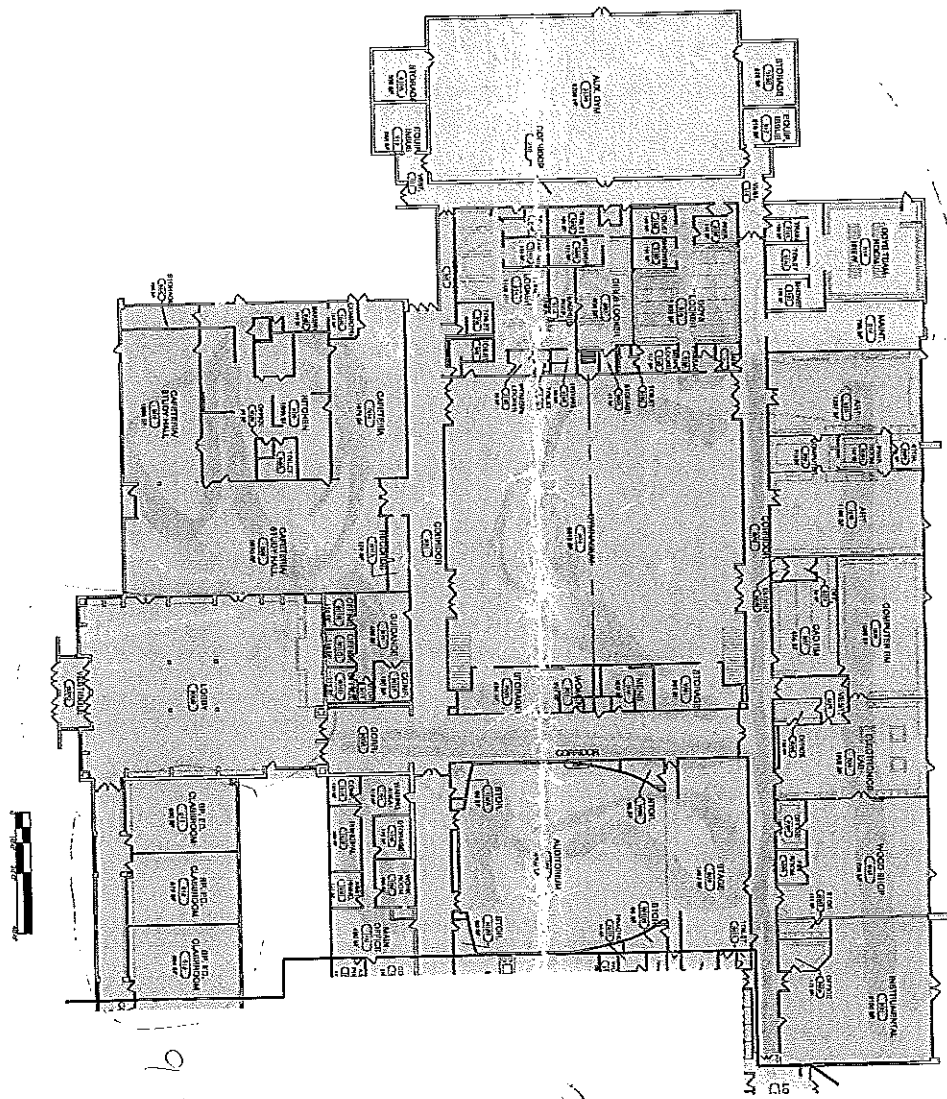
----- End of Readings -----



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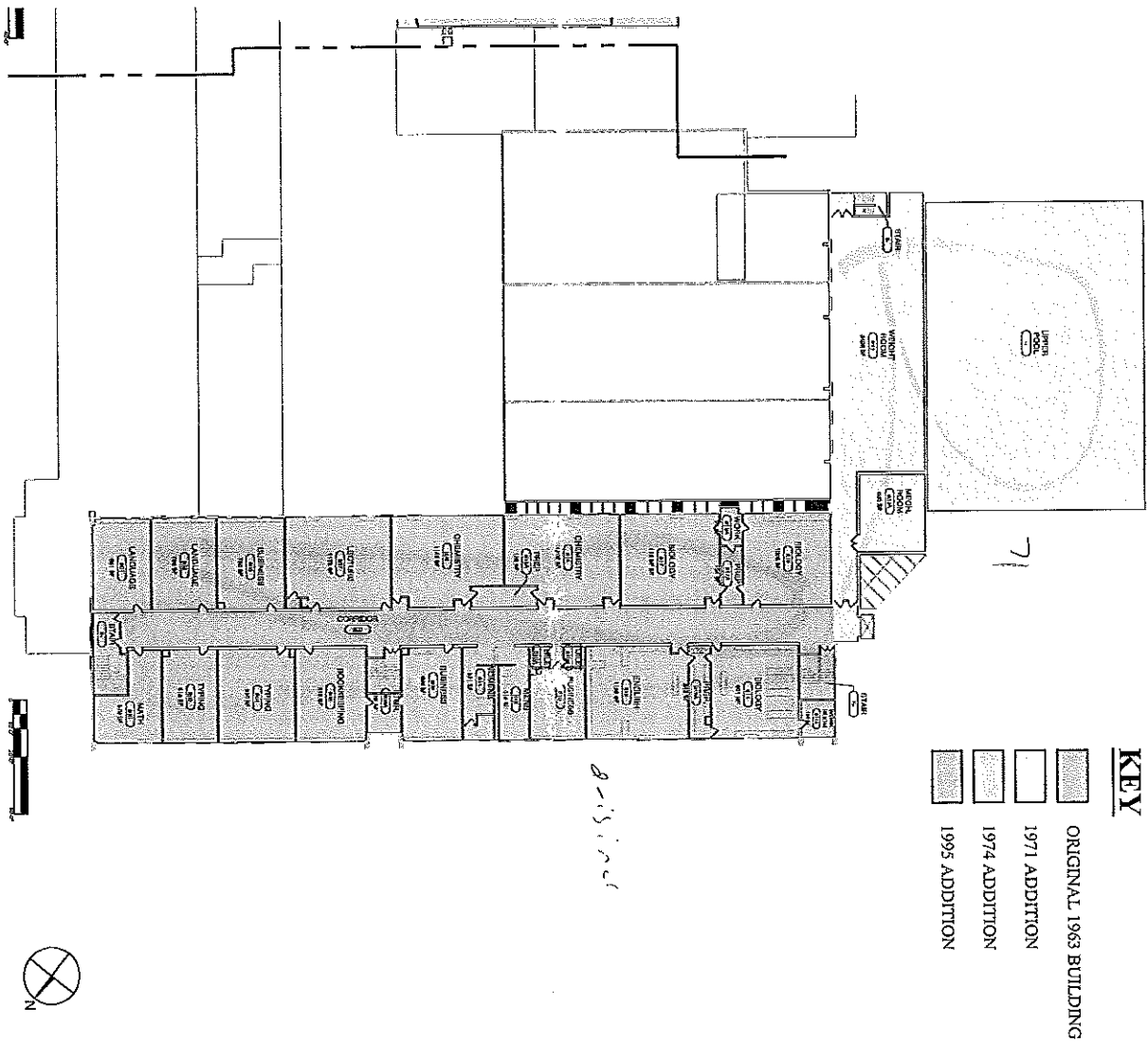
Appendix C Floor Plans

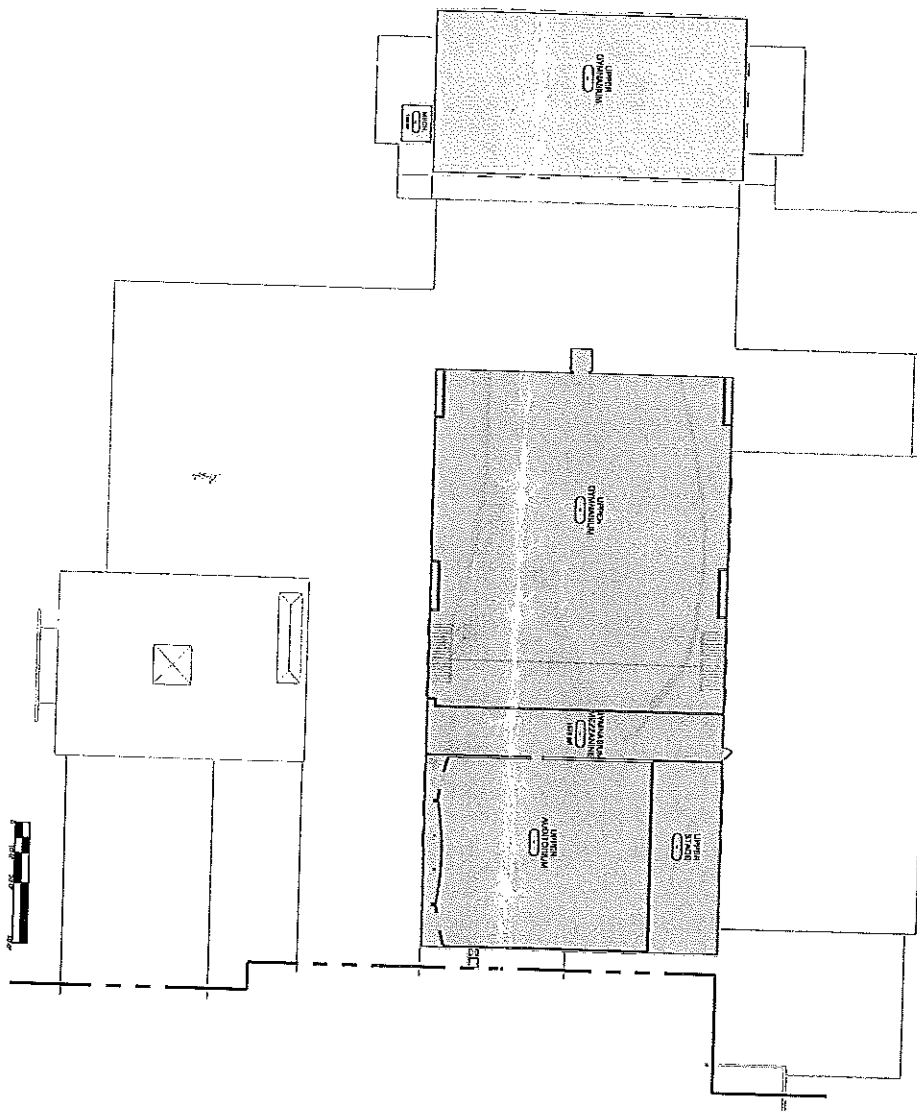


KEY

- ORIGINAL 1963 BUILDING
- 1971 ADDITION
- 1974 ADDITION
- 1995 ADDITION

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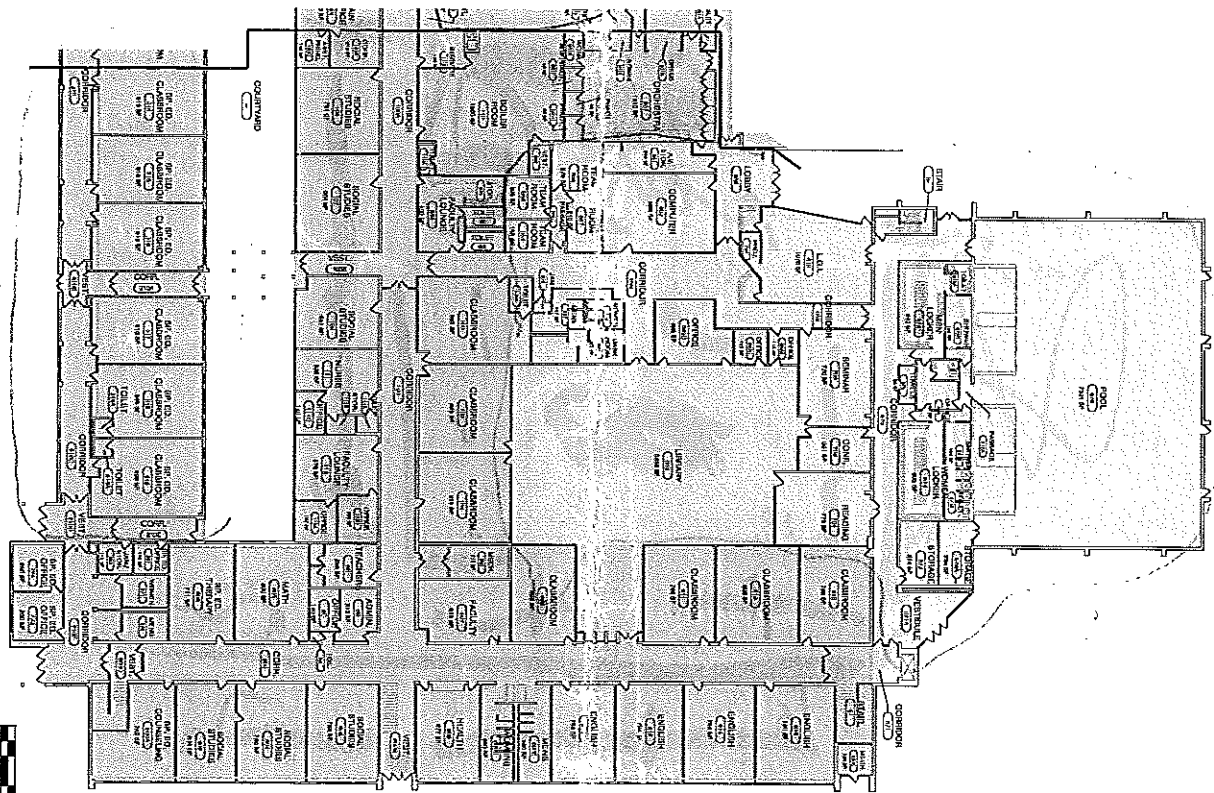




KEY

- ORIGINAL 1963 BUILDING
- 1971 ADDITION
- 1974 ADDITION
- 1995 ADDITION

Joe Long



- KEY**
- ORIGINAL 1963 BUILDING
 - 1971 ADDITION
 - 1974 ADDITION
 - 1995 ADDITION



WEST HIGH SCHOOL

FIRST FLOOR PLAN - NORTH | CORNING-PAINTED POST CSD

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Concrete foundation walls.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads.
- G. Concrete finishing.
- H. Concrete curing.

1.2 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ACI MNL-66 - ACI Detailing Manual; 2020.
- C. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- D. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
- E. ACI PRC-304 - Heavyweight Concrete: Measuring, Mixing, Transporting and Placing; 2020.
- F. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- G. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- H. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- I. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- J. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- K. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- L. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- M. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- N. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- O. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2017.

- P. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2022.
- Q. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.
- R. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2021.
- S. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022a.
- T. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- U. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- V. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- W. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- X. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.
- Y. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- Z. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- AA. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2022.
- AB. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.
- AC. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- AD. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2021.
- AE. ASTM C 1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete, 2017.
- AF. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2010a (Reapproved 2015).
- AG. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2015.
- AH. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.
- AI. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.
- AJ. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.
- AK. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.
- AL. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs; 2017.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products such as joint devices, attachment accessories, and admixtures, showing compliance with specified requirements.
 - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
- D. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
 - 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
 - 4. Submit 28 day concrete strength test data for each mix design per ACI CODE-318 requirements.
 - a. Provide a minimum of 15 concrete strength tests, where a concrete strength test is the average strength of at least two 6x12 inch or three 4x8 inch cylinders.
 - b. If 15 concrete tests are unavailable, the average strength of the concrete tests must exceed the required strength by 1200psi for up to 5000 psi mix concrete.
- E. Samples: Submit samples of underslab vapor retarder to be used.
- F. Reinforcing Placement Drawings: Comply with requirements of ACI MNL-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices, supporting & spacing devices. Indicate quantities of reinforcing steel and welded wire fabric.
- G. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- H. Reports: Submit certified copies of mill test report of reinforcement materials analysis.
- I. Test Reports: Submit report for each test or series of tests specified.
- J. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

1.4 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for requirements.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.5 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- C. Follow recommendations of ACI PRC-306 when concreting during cold weather.

1.6 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Steel.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.2 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
 - 1. Form: Flat Sheets.
 - 2. WWR Style: As indicated on drawings.
- C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.
- D. Fiber Reinforcement: Alkali-resistant polypropylene monofilament complying with ASTM C1116/C1116M, 24 ksi minimum tensile strength. Mixing rate per manufacturer's recommendations.
 - 1. Fiber Length: 0.75 inch, nominal.
 - 2. Products:
 - a. Fibermesh 150 by Propex Concrete Systems: www.fibermesh.com
 - b. FRC Mono 150 by FRC Industries: www.frcindustries.com
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.

1. Acquire aggregates for entire project from same source.
 2. Coarse Aggregate Maximum Size: In accordance with ACI CODE-318.
- C. Fly Ash: ASTM C618, Class F. Loss on ignition requirement waived if used in flowable fill concrete mix.
- D. Water: ACI 318; Clean and not detrimental to concrete.

2.4 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.

2.5 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 2. Products:
 - a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - b. Poly-America; Husky Yellow Guard 15-mil Vapor Barrier: www.yellowguard.com/#sle.
 - c. Stego Industries, LLC; Stego Wrap 15-mil: www.stegoindustries.com/#sle.
 - d. Tex-Trude, LP; Xtreme Vapor Barrier (15-mil): www.tex-trude.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
1. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
 2. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.
 3. Flowable Products:
 - a. Euclid Chemical Company; NS GROUT: www.euclidchemical.com/#sle.
 - b. Five Star Products, Inc; Five Star Fluid Grout 100: www.fivestarprouducts.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, nonmetallic aggregate, and activator.
1. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.

2.6 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.
 - 2. Products:
 - a. Adhesives Technology Corporation: www.atcepoxy.com/#sle.
 - b. Kaufman Products Inc; SurePoxxy HM Class B: www.kaufmanproducts.net/#sle.
 - c. SpecChem, LLC; SpecPoxxy 1000, SpecPoxxy 2000, SpecPoxxy 3000, or SpecPoxxy 3000FS: www.specchemllc.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.
 - 1. Material: ASTM D1751, Nonextruding, resilient asphalt impregnated fiberboard or felt.
- D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
 - 1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 - 2. Height: To suit slab thickness.
- E. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush mounted; color as selected.

2.7 CURING MATERIALS

- A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- B. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
- C. Moisture-Retaining Sheet: ASTM C171.
 - 1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 - 2. Non-staining cotton fabric, weighing not less than 8 oz/per square yd, bonded to prevent separation during handling and placing.
- D. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- E. Water: Potable, not detrimental to concrete.

2.8 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
- D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

2.9 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
 - 1. Fiber Reinforcement: Batch and mix as recommended by manufacturer for specific project conditions.
- B. Transit Mixers: Comply with ASTM C94/C94M.
- C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.1 EXAMINATION

- A. See Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
- B. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- C. Remove water from areas receiving concrete before concrete is placed.
- D. Verify that forms are clean and free of rust before applying release agent.
- E. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- F. Wet sticking anchor rods shall not be permitted.
- G. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions. Remove laitance, coatings & unsound materials.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- H. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- I. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 - 1. Unroll Vapor Barrier with the longest dimension parallel with the direction of the pour.
 - 2. Lap Vapor Barrier over footings and seal to foundation walls.

3. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
4. Seal all penetrations (including pipes) with pipe boot and tape.

3.3 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

3.4 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
- B. Notify testing laboratory and Architect not less than 24 hours prior to commencement of placement operations.
- C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

3.5 SLAB JOINTING

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Install joint covers in longest practical length, when adjacent construction activity is complete.
- I. Apply sealants in joint devices in accordance with Section 07 92 00.
- J. Deposit concrete at final position. Prevent segregation of mix.
- K. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- L. Consolidate concrete.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Place floor slabs in checkerboard or saw cut pattern indicated.

- P. Screed floors level, maintaining the following minimum F(F) Floor Flatness and F(L) Floor Levelness values when measured in accordance with ASTM E1155.

3.6 SEPARATE FLOOR TOPPINGS

- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Place concrete floor toppings to required lines and levels.
 - 1. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- E. Screed toppings level, maintaining surface flatness of maximum 1/8 inch in 10 feet.

3.7 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for compliance with specified tolerances.
- B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 35; F(L) of 25, on-grade only.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
- C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value.
- E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.8 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
 - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
- D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot nominal if not indicated on the drawings.

3.9 CURING

- A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.10 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318 and applicable code.
- C. Provide free access to concrete operations at project site and cooperate with appointed firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- E. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- F. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172/C172M.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of four cylinders for every 50 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.
- G. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- H. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: In accordance with ACI CODE-318 and applicable code.
 - 3. Test one cylinder at 7 days.
 - 4. Test two cylinders at 28 days.
 - 5. Retain one cylinder for 56 days for testing when requested by Architect.
 - 6. Dispose remaining cylinders when testing is not required.
- I. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.11 PATCHING

- A. Allow Architect to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect upon discovery.
- C. Patch imperfections as directed by Architect in accordance with ACI CODE-318.

3.12 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.13 PROTECTION

- A. If cold weather provisions of ACI PRC-306 are required:
 - 1. Protect fresh concrete from freezing by heating the ground and forms to minimum temperatures of ACI PRC-306.
 - 2. Thermally protect the fresh concrete the following durations
 - a. Concrete footings/walls - 48 hours after placement
 - b. Concrete piers - 72 hours after placement.
 - c. Concrete slabs on grade - 72 hours after placement.
- B. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION 03 30 00

SECTION 03 35 45
POLISHED CONCRETE TOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface Preparation and Cleaning.
- B. Application of Polymer Modified Polishable Cementitious Overlay (PMPCO).
- C. Application of Liquid Densifier.
- D. Polishing and Grinding.
- E. Application of Protective Sealer.

1.2 REFERENCE STANDARDS

- A. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- B. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials; 2021.
- C. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- E. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- F. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).
- G. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.
- H. ASTM E430 - Standard Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry; 2019.
- I. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.
- J. ISO 9001 - Quality Management Systems — Requirements; 2015.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Floor Polish Conference: Prior to the start of the overlay application and floor polishing process the Contractor is to conduct a meeting to inspect the specified mock-up and determine approval. The specified process, including required methods and procedures to achieve the specified polished floor finish are to be reviewed. The Contractor is to send a Pre-Polish Conference agenda to all attendees twenty days prior to scheduled date of the conference. Contractor is to require responsible representatives of every party concerned with PMPCO work to participate in the conference, including but not limited to the following:
 - 1. Contractor's Superintendent.
 - 2. PMPCO Manufacturer.
 - 3. Bonding Agent Manufacturer.
 - 4. Liquid Densifier Sealer Manufacturer.

5. Polishing Contractor.
 6. Owner's Representative.
- B. Minutes of the meeting shall be recorded, typed, and distributed by the Contractor to all concerned parties, including but not limited to the Owner's representative and the Architect within five days of the meeting.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's product data including surface preparation and installation instructions for each type of product indicated.
- C. Samples for Color Selection: Submit manufacturer's 6- by 6-inch sample chips, including pigment color and required dosage rate for each color.
- D. Samples for Sheen Selection: Submit 6- by 6-inch sample chips of one color illustrating finish sheens available including corresponding finish grit.
- E. Verification Sample: Following selection of color and sheen, provide two color chips illustrating chosen color and sheen for verification and approval.
- F. Floor Polishing Equipment Data: Including unit's head down pressure, minimum grinding width, max RPM, and verification of adjustable grinding pressure.
- G. Diamond Tooling Data: Indicating that only matched sets will be used throughout entire process.
- H. Approved applicator certificate for applicator of liquid densifier/sealer and polishing process.
- I. Installers Qualification Statement.
- J. Polishing Installers Project References: Provide list of successfully completed polishing projects meeting specified criteria. Include the following information for each project reference;
 1. Project Name.
 2. Project Location.
 3. Type and Quantity of Grind and Polished Concrete Provided.
 4. Project Architect and Contact Info.

1.5 QUALITY ASSURANCE

- A. The work of this section, for proper execution of warranty, shall ensure:
 1. All materials incorporated into the work be sourced from a single manufacturer.
 2. Placement, application of, and finishing of the system is performed by installers and applicators approved by the manufacturer.
- B. Manufacturer Qualifications: All bonding agents, polymer modified cementitious overlay and liquid floor treatments shall be manufactured by a single manufacturer, with a minimum of years experience in the polished overlay systems.
 1. Manufacturer of all system components is to be ISO 9001 certified.
- C. Grind and Polishing Contractor Qualifications:
 1. All Grinding and Polishing operations and applications are to be performed by an approved applicator of liquid densifier sealer manufacturer. Contractor is to solicit and accept pricing only from those applicators included in manufacturer's list of approved applicators. In addition to manufacturer approval, successful completion of at least three projects of similar size and scope within the past five years is to be required of each potential bidder. Experienced mechanics from previous applications including lead mechanic, are to be on site at all times while work is being performed.

D. Control of Installation:

1. Contractor shall provide sufficient personnel, plant, and materials to complete overlay placement in a single pour in one working day to avoid cold joints and inconsistencies in color or placement.

1.6 MOCK UP

A. Polymer Modified Polishable Cementitious Overlay (PMPCO) Mock-Up:

1. Prior to the Pre-Polish Conference, the polishing subcontractor is to provide a 3 foot by 3 foot, minimum mock up in designated mock-up area. Area is to have lighting similar in illumination, lumen output, color temperature, and both height and distance from surface as that of final areas to receive specified polished surfaces. Use the same personnel, equipment, tools and methods as will be used for the remaining interior floor slab. Mockup is to demonstrate each color, pattern, all joint treatments, inside wall edge treatments, and any protective sealers.
2. Notify Architect seven days in advance of dates and times when mockups will be completed.
3. Do not begin full scale product applications, floor polishing operations, or deliver major materials until Architect have reviewed and accepted the mockup panels.
4. Once accepted by Owner's representative, store mock-up on site as directed, and protect from damage.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 20-year manufacturer warranty against installation defects and material performance; ensure forms have been completed in Owner's name and registered with manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer:
 1. Euclid Chemical Company: www.euclidchemical.com.
- B. The following specifications are provided as a guide to the minimum actions required to provide a grind and polished PMPCO. It is the contractor/installers' ultimate responsibility to provide a polished/ground floor meeting the specified criteria and that matches the approved mock up.

2.2 POLYMER MODIFIED POLISHABLE CEMENTITIOUS OVERLAY (PMPCO)

- A. PMPCO: Provide prepackaged, cement based, single component, self-leveling cementitious topping designed for interior application and containing aggregate suspension technology that keeps the graded natural aggregate suspended at the surface where it can be ground and exposed to resemble a polished concrete floor after grinding and polishing. Material is to be micro fiber enhanced with advanced cement technology to allow polishing and/or coating in 24 hours.
 1. Minimum Compressive Strength per ASTM C109/C109M:
 - a. 4,800 psi at 24 hours.
 - b. 7,000 psi at 28 days.
 2. Product: LEVEL TOP PC AGG by Euclid Chemical.
 3. Color: As selected by Architect from manufacturer's full line.

- B. Epoxy Bonding Agent: 100 percent solids epoxy as recommended by PMPCO manufacturer.
 - 1. Product: EUCOFLOOR EPOXY PRIMER by Euclid Chemical.
- C. Silica Sand for Broadcast Into Epoxy Bonding Agent: Factory packaged in moisture proof bag, clean, dry, non-reactive silica sand, 16 mesh gradation. Contractor is to provide engineer with a letter of approval issued by sand supplier stating that proposed silica sand is non-reactive (ASR) with cement based products.

2.3 LIQUID FLOOR SLAB TREATMENTS

- A. All liquid floor treatments are to be manufactured by same manufacturer as PMPCO and are to be fully compatible as specified herein.
- B. Liquid Densifier Sealer: High performance, deeply penetrating concrete densifier; odorless, colorless, VOC - compliant, non-yellowing silicate and siliconate based solution designed to harden, dustproof and protect concrete floors and to resist black rubber tire marks.
 - 1. Product: ULTRASIL LI+ by Euclid Chemical.
- C. Protective Sealer: Provide water based, penetrating sealer designed to protect polished cementitious surfaces against stain and dirt intrusion.
 - 1. Product: ULTRAGUARD by Euclid Chemical.

2.4 ACCESSORIES

- A. Crack Repair Epoxy: Two component, 100 percent solids, moisture insensitive, ASTM C881/C881M compliant, high modulus epoxy resin.
 - 1. Product: DURAL 452 LV by Euclid Chemical.
- B. Divider Strips: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip with anchoring features.
- C. Control Joint Strips: 1/8 inch nominal width zinc exposed top strips, zinc coated steel concealed bottom strips, 1/8 inch wide neoprene filler strip between vertical strips, with anchoring features.
- D. Divider and Control Joint Strip Height: To suit thickness of topping, with allowance for grinding & polishing.

2.5 GRINDING AND POLISHING EQUIPMENT

- A. Polishing and grinding steps up to 1500 grit resin bonded tooling providing finish with specular gloss value of not less than 60 per ASTM E430 when measured using a Horiba IG-320 Gloss Checker in accordance with ASTM D523, at 10 feet on center across the entire polished floor surface
- B. Grinding and Polishing Machine: Diamond grinding machinery is to be specifically designed to grind, and polish concrete floors. Machinery is to provide minimum grinding pressure of 218 lbs, minimum grinding width of 20 inches, and is to be equipped with adjustable grinding pressure to ensure even grinding.
 - 1. Basis of Design Equipment:
 - a. PDG 5000 by the SASE Company: www.Sasecompany.com.
 - b. Or Architect approved equivalent.
- C. Diamond Tooling: Diamond tooling for grinding and polishing concrete is to be resin and/or metal bonded diamond tooling originating from a single manufacturer and capable of providing specified polished concrete finish.
 - 1. Basis of Design:
 - a. SASE Company, Inc: www.SASECompany.com
 - b. Or Architect approved equal.

- D. High Speed Propane Burnisher: For the final buffing operation using 800 grit and 1500 grit burnishing pads.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Floor Flatness and Levelness Tolerances
 - 1. See Section 01 40 00 - Quality Requirements for inspection requirements.
 - 2. Measure FF Floor Flatness and FL Floor Levelness in accordance with ASTM E1155 and following ACI SPEC-117 using 3D laser imaging prior to mechanically abrading existing floor slab; report both composite overall values and local values for each measured section.
 - a. Recommended FF Floor Flatness and FL Floor Levelness Values: FF of 50; FL of 20.
 - b. Minimum FF Floor Flatness and FL Floor Levelness Values: FF of 35; FL of 18.
 - 3. Notify Architect if existing slabs are not within the stated tolerances, and determine corrective actions prior to proceeding.

3.2 SURFACE PREPARATION

- A. New concrete must be a minimum 28 days old prior to commencement of operations.
- B. Mechanically abrade the surface by shot-blast to achieve a surface profile equal to CSP 3-5 in accordance with ICRI 310.2R.
- C. Concrete surfaces must be structurally sound and free of loose or deteriorated concrete and free of dust, dirt, paint, efflorescence, oil and other contaminants.
- D. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- E. Perimeter Keyway: Cementitious overlay is to be keyed into base slab at perimeter and all terminations by saw cutting a 0.25 inch deep key way into the base slab.
- F. Cracks and Joints:
 - 1. Prepare, treat, rout, and fill all non-moving cracks over 1/16 inch in width, with specified crack repair epoxy, according to manufacturer's written recommendations.
 - 2. All joints, and control joints are to be brought up through the overlay and sealed with the specified polyurethane sealant approved by PMPCO manufacturer.
 - 3. Comply with recommendations in ASTM C1193 for joint-sealant installation.

3.3 EPOXY BONDING AGENT APPLICATION

- A. Condition the epoxy bonding agent to proper temperature in accordance with manufacturer's recommendations prior to mixing. Mix and place epoxy primer to the prepared floor slab in accordance with manufacturer's written instructions at a coverage rate of 75 to 100 SF per gallon.
- B. Evenly broadcast approved silica sand to refusal into wet epoxy bonding agent. Continue broadcast until epoxy refuses to wet out aggregate. Entire surface is to be covered with dry loose excess aggregate.
- C. Allow epoxy to cure per manufacturer's published recommendations. Following cure of epoxy bonding agent remove all loose aggregate from floor surface.

3.4 POLYMER MODIFIED POLISHABLE CEMENTITIOUS OVERLAY APPLICATION (PMPCO)

- A. Mix PMPCO per manufacturer's published recommendations.
- B. Pour mixed PMPCO onto the surface and spread with gauge rake to minimum 3/8 inch thickness. Smooth with magic trowel as needed.

3.5 LIQUID FLOOR TREATMENT APPLICATION

- A. Liquid Densifier Sealer Treatment: Once PMPCO has been ground to 150 grit metal bonded diamond tooling level or equivalent, apply and finish penetrating liquid densifier sealer floor treatment according to manufacturer's written instructions.
 - 1. Thoroughly clean surface to remove any slurry, dust, or other surface debris.
 - 2. Apply Liquid Densifier Sealer in strict accordance with the directions of the manufacturer. Spray, squeegee or roll liquid on to clean surface at rate that results in uniformly wet surface without puddles. Keep floor wet with Liquid Densifier for 5 to 10 minutes. While densifier is still wet use a soft bristle broom or microfiber pad to redistribute the Liquid Densifier. Do not continue to brush or spread once product begins to dry. Remove all excess. Do not allow Liquid Densifier to puddle and dry on floor.
 - 3. Complete polishing and grinding steps and allow Liquid Densifier Sealer 12 hours of drying time before proceeding to application of Protective Sealer.
- B. Protective Sealer Application: Once PMPCO has been polished to final polishing level and allowed minimum 12 hours dry time, dilute protective sealer at a 1 to 1 ratio with water and apply at manufacturer's recommended coverage rate.

3.6 PMPCO POLISHING AND GRINDING PROCESS

- A. Commence polishing and grinding process minimum 24 hours after placement of PMPCO.
- B. Polishing/Grinding Steps: The process described herein constitutes one complete Polishing/Grinding Step:
 - 1. Mount diamond tooling of appropriate grit and bond to all grinding heads on Polishing Machine so as to assure that machinery is operating at full and balanced grinding capacity.
 - 2. Polish/Grind floor at a rate to allow for an even scratch pattern.
 - 3. Each polishing/grinding pass must overlap 50 percent of previous polishing/grinding pass.
 - 4. All polishing/grinding passes are to be made in the same direction, either longitudinal, or latitudinal, until the entire given area to be polished/ground has been covered.
- C. Recommended Polishing/Grinding Steps for Initial Grinding and Floor for Polishing Utilizing specified SASE Equipment:
 - 1. Grinding:
 - a. Grinding Step 1: 80 grit metal bonded diamond tooling.
 - b. Grinding Step 2: 150 grit metal bonded diamond tooling cross cutting previous grinding pattern.
 - 2. Liquid Densifier Sealer Application.
 - 3. Polishing:
 - a. Polishing Step 1: 100 grit resin bonded diamond tooling.
 - b. Polishing Step 2: 200 grit resin bonded diamond tooling.
 - c. Polishing Step 4: 400 grit resin bonded diamond tooling.
 - d. Polishing Step 5: 800 grit resin bonded diamond tooling.
 - e. Polishing Step 6: 1500 grit resin bonded diamond tooling.
 - 4. Allow minimum 12 hours dry time prior to next step.
 - 5. Protective Sealer Application.
 - 6. Burnishing:
 - a. High Speed Burnish Step 1: 800 grit burnishing pad.

- b. High Speed Burnish Step 2: 1500 grit burnishing pad.

3.7 FIELD QUALITY CONTROL AND ACCEPTANCE

- A. Defective Concrete: Repair or replace concrete not complying with required lines, details, dimensions, tolerances, or specified requirements at no additional cost to Owner.
- B. Slip Resistance: Minimum 0.43 in accordance with ANSI A326.3 after polishing.
- C. Upon completion, the quality of the various special floor finishes are to meet and match the qualities, color renditions, sheens and types of finished surfaces specified and those of the mock ups, which were reviewed and approved as quality control guides.

3.8 PROTECTION

- A. Protect finished floor from damage, dirt pick-up, staining, construction traffic and wear until substantial completion.

END OF SECTION 03 35 45

SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Liquid-applied self-leveling floor underlayment.
 - 1. Use cementitious type at all locations.

1.2 RELATED REQUIREMENTS

- A. Section 01 70 00 - Execution and Closeout Requirements: Alteration project procedures; selective demolition for remodeling.

1.3 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.
- C. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2021.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, mixing instructions, environmental limitations, and installation instructions.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Instructions.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.7 FIELD CONDITIONS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.

- B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Cementitious Underlayment:
 - 1. ARDEX Engineered Cements; ARDEX V 1200 with ARDEX P51 Primer: www.ardexamericas.com/#sle.
 - 2. CMP Specialty Products; Level-1 with AS-100 Primer: www.cmppsp.com
 - 3. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - 4. Sika Corporation; Product Sikafloor Level 50. www.sikaconstruction.com

2.2 MATERIALS

- A. Cast Underlayments, General:
 - 1. Comply with applicable code for combustibility or flame spread requirements.
- B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
 - 1. Compressive Strength: Minimum 4500 pounds per square inch after 28 days, tested per ASTM C109/C109M.
 - 2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
 - 3. Density: 125 pounds per cubic foot, nominal.
 - 4. Final Set Time: 1-1/2 to 2 hours, maximum.
 - 5. Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch.
 - 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E 84.
- C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.
- E. Primer: Manufacturer's recommended type.
- F. Joint and Crack Filler: Latex-based filler, as recommended by manufacturer.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Add aggregate for areas where thickness will exceed 1 inch or as required per product manufacturer. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.
- C. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

- A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.
- C. Vacuum clean surfaces.
- D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.
- E. Close floor openings.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Pump or pour material onto substrate. Do not retemper or add water.
 - 1. Pump, move, and screed while the material is still highly flowable.
 - 2. Be careful not to create cold joints.
 - 3. Wear spiked shoes while working in the wet material to avoid leaving marks.
- C. Place to thickness indicated on Drawings or as required to achieve finished floor elevation, with top surface level to 1/16 inch in 10 ft.
- D. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.
- E. Place before partition installation.
- F. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.
- G. If a fine, feathered edge is desired, initial preparation per manufacturers recommendations and steel trowel the edge after initial set, but before it is completely hard.

3.4 CURING

- A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.
- B. Air cure in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field inspection and testing, as specified in Section 01 40 00 - Quality Requirements.
- B. Placed Material: Agency will inspect and test for compliance with specification requirements.

3.6 PROTECTION

- A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.
- B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION 03 54 00

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members, support members.
- B. Base plates, shear stud connectors, expansion joint plates, and anchors.
- C. Grouting under base plates.

1.2 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Coordination and Project Conditions

1.3 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; 2017.
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
- G. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2022.
- H. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
- I. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.
- J. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
- K. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.
- L. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2018.
- M. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.
- N. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.
- O. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.
- P. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

- Q. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.
- R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- T. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- U. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- V. SSPC-SP 3 - Power Tool Cleaning; 2018.
- W. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections.
 - 3. Indicate cambers.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

1.5 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Maintain one copy of each document on site.
- C. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience with current AISC Quality Management Systems (QMS) Certification, Certified Building Fabricator, BU.
 - 1. Non AISC certified companies are acceptable with the following requirements:
 - a. A special inspector hired by the owner will be required to observe all fabrication of the structural steel for this project.
 - b. The cost for the special inspection fees incurred during fabrication shall be reimbursed to the owner by the contractor.
- D. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- E. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.
- F. Shop Painter: Company specializing in performing Work of this section with minimum 3 years documented experience with the following current AISC Certification:
 - 1. Sophisticated Paint Endorsement - Enclosed (P1)
 - 2. Sophisticated Paint Endorsement - Covered (P2)
 - 3. Sophisticated Paint Endorsement - Outside (P3)

- G. Welders and Welding Procedures: AWS D1.1 Structural Welding Code - Steel, qualified within previous 12 months.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
- E. Steel Plate: ASTM A514/A514M.
- F. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.
- G. Headed Anchor Rods: ASTM F1554, Grade 36, plain.
- H. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.
- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- J. Sliding Bearing Plates: Teflon coated.
- K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- L. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.

2.3 FINISH

- A. Prepare structural component surfaces in accordance with SSPC-SP 3.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
 - 1. Color: Gray
- C. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating. Galvanize after fabrication.
- D. All exterior exposed steel to be galvanized.
- E. Galvanizing for Fasteners, connectors and Anchors
 - 1. Hot-dipped Galvanizing: ASTM A153/A153M.
 - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Shop test bolted and welded connections as specified for field quality control tests.
- C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.
 - 1. Verify bearing surfaces are at correct elevation.
 - 2. Verify anchor rods are set in correct locations and arrangements with correct exposure for steel attachment.

3.2 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components indicated on shop drawings.
- D. Field connect members with threaded fasteners; torque to required resistance. Tighten to snug tight for bearing type connections.
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.3 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing, and 01 45 33 - Code-Required Special Inspections and Procedures.
- B. Bolted Connections: Inspect in accordance with AISC specifications.
 - 1. Visually inspect all bolted connections.
 - 2. For Direct Tension Indicators, comply with requirements of ASTM F959/F959M. Verify that gaps are less than specified in Table 2.
- C. Welded Connections: Inspect welds in accordance with AWS D1.1/D1.1M.

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 2. Visually inspect all welds.
 3. Radiographic testing performed in accordance with ASTM E94/E94M. Performed when directed by Architect/Engineer.
 4. Ultrasonic testing performed in accordance with ASTM E164. Perform on all full penetration welds.
 5. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
 6. Magnetic particle inspection performed in accordance with ASTM E709. Performed when directed by Architect/Engineer.
- D. Correct defective bolted connections and welds.

END OF SECTION 05 12 00

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated steel and metal items, including:
 - 1. Lintels
 - 2. Structural supports for miscellaneous attachments

1.2 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- H. NOMMA Guideline 1 - Joint Finishes
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- K. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept metal fabrications on site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Steel Plates: ASTM A 36/A 36M.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A 653, Grade 33 Structural quality with galvanized coating.
- F. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- G. Bolts, Nuts, and Washers:
 - 1. Bolts: ASTM F3125; Type 1
 - 2. Nuts: ASTM A 563 heavy hex type
 - 3. Washers: ASTM F 436; Type 1
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, Type 1, complying with VOC limitations of authorities having jurisdiction.
 - 1. Color: Gray
- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FABRICATED ITEMS

- A. Lintels: Steel sections, size and configuration as detailed on drawings, length to allow 8 inches minimum bearing on both sides of opening.
 - 1. Galvanized and Prime paint, one coat
- B. Other Structural Supports: Steel sections, shape and size as indicated on drawings required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat.

- C. Anchor bolts: ASTM F 1554; Grade 36, weldable, straight shape, Furnish with nut and washer; unfinished.
- D. Exterior Stair Nosings: 4 inch Wide Cast aluminum with intergrate abrasive treads. Model #801 (Poured Concrete stairs) Model 801SP (Poured concrete-filled steel pan stairs) as manufactured by American Safety Tread Company Inc. Color: Natural Metal Finish.

2.4 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and items as specified in drawings.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements; minimum 2.0 oz/sq ft coating thickness.
- G. Galvanizing for Fasteners, Connectors and Anchors: Hot-Dipped Galvanizing to ASTM A 153/A 153M.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story or for every 12 ft in height whichever is greater, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

END OF SECTION 05 50 00

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Stair railings and guardrails.
- C. Free-standing railings at steps and Pool ADA Ramp.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 09 91 13 - Exterior Painting: Paint finish.

1.3 REFERENCE STANDARDS

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
- D. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- E. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2021).
- F. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- G. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.
- H. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- J. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
- K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- L. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
1. Calculations shall take into account all vertical and lateral loads required by applicable building codes. Calculations shall show all reactions for connection to structural members and shall be designed so that no eccentric or torsional forces are induced in the structural members.
 2. Calculations shall be prepared by and signed and sealed by a structural Engineer licensed in the State of New York.

1.5 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State of New York, or personnel under direct supervision of such an engineer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Handrails and Railings:
1. Blumcraft of Pittsburgh
 2. Hollaender Manufacturing Co

2.2 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- H. At Pool ADA Ramp - Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
1. Ease exposed edges to a small uniform radius.
 2. Welded Joints:

- a. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

2.3 STEEL RAILING SYSTEM

- A. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- B. At Pool ADA Ramp Railing - Steel Pipe: 304 or 316L Marine Grade Stainless Steel
- C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- D. At Pool ADA Ramp Railing - Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: No exposed bolts or screws.
- F. At Pool ADA Ramp Railing - Fasteners: All fasteners to be stainless steel
- G. Components for Pool ADA Ramp Railing: all components to be stainless steel.
- H. Straight Splice Connectors: Steel welding collars.
- I. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.4 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/8 inch.
- C. Maximum Out-of-Position: 1/8 inch.

END OF SECTION 05 52 13

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preservative treated wood materials.
- B. Fire retardant treated wood materials.
- C. Concealed wood blocking, nailers, and supports.

1.2 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Samples: For rough carpentry members that will be exposed to view, submit two samples, 6 by 6 inch in size illustrating wood grain, color, and general appearance.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.1 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 at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.2 EXPOSED DIMENSION LUMBER

- A. Sizes: Nominal sizes as indicated on drawings.
- B. Surfacing: S4S.
- C. Moisture Content: S-dry or MC19.

2.3 ACCESSORIES

- A. Fasteners and Anchors:

1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, hot dipped galvanized per ASTM A153/A153M elsewhere.
2. Anchors: Toggle bolt type for anchorage to hollow masonry.
3. Fasteners for roof replacements must be included in the Singly-Ply Roofing membrane manufacturer's warranty to meet uplift pressures determined in accordance with the Applicable Code using a basic wind speed of 120 MPH.

2.4 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. Fire Retardant Treatment:
 1. Products:
 - a. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Do not use treated wood in direct contact with the ground.
 3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat rough carpentry items as indicated .
 - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Treatment: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.
 1. Products:
 - a. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 PREPARATION

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

3.2 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.

3.3 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.
- E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

END OF SECTION 06 10 00

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Hardware.
- C. Preparation for installing utilities.
- D. Custom designed millwork and other items as detailed on drawings.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.
 - 1. Mock-up to be presented to Architect for approval during or just prior to this meeting.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
 - 2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.

1.5 MOCK-UPS

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
- B. See Section 01 40 00 - Quality Requirements for additional requirements.
- C. Locate where directed.
- D. Mock-up may remain as part of the work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect units from moisture damage.

1.7 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
- B. Do not install cabinets until all mortar, moisture and dust producing work is completed.
- C. Provide portable fans and ventilate rooms receiving new casework for minimum of one week after installation of new cabinets. Continue operation of fans and ventilation of rooms until owner determines that all fumes related to cabinets have been dissipated.
- D. Verify field measurements prior to fabrication.

1.8 REGULATORY REQUIREMENTS

- A. Cabinets and cabinet finish system are to meet Class "C" rating or better for flame spread (200 or less) and shall have a smoke developed rating of less than 450.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Campbell Rhea Division Mohon International, Inc; Heritage Maple Series.
- B. CiF Lab Solutions: www.cifsolutions.com.
- C. EM Pfaff & Son; (607) 739-3691.
- D. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Single Source Responsibility: Provide this work from single fabricator.

2.2 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Species of Veneer: Maple.
- C. Cut or Slicing of Veneer: Plain / Flat Sliced.
- D. Matching of Individual Leaves to Each Other: Book matching.
- E. Matching Across the Panel Face: Pair matching.
- F. Matching of Panels to Each Other: Sequence matched uniform size sets.
- G. Cabinet Frame: Solid hardwood lumber with pinned mortise and tenon joints.
- H. Stiles and Rails: Solid Maple lumber.
- I. Wood Drawer Fronts: 3/4" thick solid Maple core with Maple veneer; Interior rabbeted edges with 3/8" exterior radiused edge.

- J. Drawer Boxes: Solid hardwood lumber (1/2" thick) with dovetailed joints.
- K. Drawer Bottoms: 1/4" hardwood plywood.
- L. Cabinet Back: 1/4" hardwood plywood.
- M. Cabinet Sides: 3/4" 7-ply hardwood plywood with Maple veneer on all exposed surfaces.
 - 1. Tall cabinets with 3/4" sides shall be constructed with a fixed center shelf rigidly attached to either side of the cabinet to prevent bowing of the sides.
- N. Cabinet Tops: 1" hardwood plywood for all cabinet tops.
- O. Cabinet Bottoms: 1" hardwood plywood for all wall cabinets.
- P. Shelves: 1" hardwood plywood, full depth, for all shelves, interior or exposed.
 - 1. Maple plywood where exposed.
 - 2. Exposed plywood edge is to be covered with a factory applied one-piece 3/8" thick solid Maple nosing.
- Q. Wood Doors:
 - 1. Maple veneer over 3/4 inch x 1 1/8 inch wide solid Maple frame. Maple veneer to be on front and back of door. Interior rabbeted edges with 3/8" exterior radiused edge.
 - 2. Tall cabinets to be 1 inch thick lipped reveal overlay style.
 - a. Core Construction: particleboard.
- R. Exposed Edges: All exposed plywood edges are to be covered with a factory applied one-piece 3/8" thick solid Maple nosing.
- S. Cabinet Baseboard: 3/4" hardwood plywood.
- T. Finished Baseboard: 4" vinyl base. See finish schedule for color.
- U. Wood Trim: Solid Maple lumber. Size as indicated on drawings.

2.3 PANEL MATERIALS

- A. Veneer Faced Plywood Finish: HPVA HP-1; graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, core of veneer (wood plies); type of glue recommended for specific application; thickness as required; face veneer as follows:
 - 1. Exposed Surfaces: Grade AA, Maple, plain sliced, book-matched.
 - 2. Semi-Exposed Surfaces: Grade A, Maple, rotary cut, random-matched.
 - 3. Concealed Surfaces: Grade B, Maple, rotary cut, random-matched.
- B. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with moisture resistant adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings.
- C. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.4 LAMINATE MATERIALS

- A. Refer to Finish Key & Schedule for placement and colors.
- B. Manufacturers:
 - 1. Formica Corporation: www.formica.com.
 - 2. Panolam Industries International, Inc: www.panolam.com/#sle.
 - 3. Wilsonart: www.wilsonart.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

- C. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- D. Provide specific types as indicated.
 - 1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors as indicated, finish as indicated.
 - 2. Vertical Surfaces: VGS / GP28, 0.028 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
 - 3. Post-Formed Surfaces: PF42, 0.042 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
 - 4. Cabinet Liner: CLS / CL20, 0.020 inch nominal thickness, through color, color as selected, finish as scheduled.
 - 5. Laminate Backer: BKL / BK20, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.5 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface. Provide 2" diameter grommet and cover at each computer work station and printer stations. Exact location to be verified in the field.
- F. Tack Board and Fabric: Fiber Board: ASTM C208, cellulosic, dry type, 3/8 inch thick with 1/8 inch thick layer cork for a total thickness of 1/2 inch, Class A rated material.
 - 1. Provide at all casework wall cabinets. Refer to drawings for additional information.
 - 2. Tack board covering: Vinyl coated fabric roll stock, conforming to the following;
 - a. Total Thickness: 9 mil.
 - b. Total Weight: 14 oz/sq yd.
 - c. Vinyl Finish Weight 18 oz/sq yd.
 - d. Roll Width: 54 inches
 - e. Pattern: Linen
 - f. Over-coating Stain resistant Polyvinyl fluoride, .0005 inch thick.

2.6 HARDWARE

- A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below:
 - 1. Hardware Types: As indicated on drawings.
 - 2. Product Grade: Grade 2.
- B. Bumper Pads: All moving items, including but not limited to, doors and drawers shall be provided with manufacturer's standard bumper pads to ensure quiet closure.
- C. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for clip supports and coordinated shelf rests, for nominal 1-1/4" inch spacing adjustments.
 - 1. Shelf clip supports shall be dual peg, plastic, with minimum length of 2-1/4".
 - a. Clips shall have integral hold down tabs to secure 3/4 and 1 inch shelves.
 - b. Capacity: 300 pounds per clip.
- D. Drawer and Door Pulls: Die cast aluminum pull, Brushed aluminum finish, 4" centers.

- E. Cabinet Locks: Keyed cylinder, master keyed, steel with satin finish.
 - 1. All locks within each room keyed the same. Each room keyed differently.
 - 2. Provide four (4) keys per room.
 - 3. Equip each lock with removable core, similar to Compex National locks.
 - 4. Provide locks at all doors and drawers, unless noted otherwise in Contract Drawings.
 - 5. Tall Hinged Doors: Three-point latching system.
- F. Cabinet Catches:
 - 1. Type: Nylon roller type. Tall cabinets to have heavy duty rubber rollers.
- G. Drawer Slides:
 - 1. Type: Full extension.
 - 2. Static Load Capacity: Heavy Duty grade; 200 lb, minimum.
 - 3. Mounting: Side mounted.
 - 4. Action to be progressive movement on precision ball bearings.
 - 5. Stops: Integral type.
 - 6. Manufacturers:
 - a. Fuller USA; FR 5210: www.fullerusa.com.
- H. Hinges: Butt, five knuckle disappearing type, 2-3/4 inch and .090 inch thick with hospital tips, steel with polished finish.
- I. Sliding Door Track Assemblies: Upper and lower track of galvanized steel construction, ball bearing carriers fitted within tracks, multiple pendant suspension attachments for door .
- J. Hooks: Double hooks, back mounted. Brushed Chrome finish.

2.7 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with 3/8" thick solid Maple nosing. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets and counter bases to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. Provide and install all trim and filler panels required to fill in all gaps between casework, lockers and adjacent wall or ceiling surfaces or to provide closure of mechanical items. Provide a complete seamless installation. (Filler panels must also be installed in gaps on top of casework).
 - 1. Trim and filler panels to match material and finish of cabinets. Filler panels shall be of equivalent length at each side of each run of casework.

3.3 ADJUSTING

- A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting and balancing.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.
- C. Ensure finished work is free of all markings made during fabrication.

SECTION 07 05 53
FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.2 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.
- C. Schedule: Completely define scope of proposed marking, and indicate location of affected walls and partitions, and number of markings.
- D. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

1.4 QUALITY ASSURANCE

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

1.5 FIELD CONDITIONS

- A. Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.
- B. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Partition Identification Labels:
 - 1. Fire Wall Signs, Inc: www.firewallsigns.com/#sle.
 - 2. Safety Supply Warehouse, Inc: www.safetysupplywarehouse.com/#sle.
 - 3. Stencil Ease: www.stencilease.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

- A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).

- B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl sign with factory applied adhesive backing.
- C. Applied Fire and Smoke Assembly Identification: Identification markings applied to partition with paint or permanent ink and a code compliant stencil.
- D. Location: On fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions; within concealed space where there is an accessible concealed floor, floor-ceiling, or attic space.
- E. Languages: Provide sign markings in English.
- F. Format: Whether adhered or applied, identification shall include, at a minimum:
 - 1. Lettering: Not less than three inches in height with a minimum 3/8 inch stroke, in contrasting color.
 - 2. Wording shall include, as applicable:
 - a. Wall Type, i.e FIRE BARRIER or SMOKE BARRIER, or similar.
 - b. Fire Resistance Rating, i.e. ONE HOUR, TWO HOUR, or similar.
 - c. PROTECT ALL OPENINGS.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

- A. Install adhered markings in accordance with manufacturer's instructions.
 - 1. Where adhered markings are used, a suitable Class A backer, permanently attached to the wall, may be used when wall surface would preclude adhesion.
- B. Install applied markings in accordance with manufacturer's instructions.

END OF SECTION 07 05 53

SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Adhered system with thermoplastic roofing membrane.
- B. Insulation, flat and tapered.
- C. Vapor retarder.
- D. Deck sheathing.
- E. Cover boards.
- F. Flashings.
- G. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood cant strips.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings, reglets.

1.3 REFERENCE STANDARDS

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022a.
- C. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing; 2021.
- D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a.
- E. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011 (Reapproved 2019).
- F. FM (AG) - FM Approval Guide; Current Edition.
- G. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2022).
- H. NRCA (RM) - The NRCA Roofing Manual; 2022.
- I. NRCA (WM) - The NRCA Waterproofing Manual; 2021.
- J. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

- C. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Warranty Documentation:
 - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 2. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least 10 years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact, unless otherwise indicated.
- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- D. Protect foam insulation from direct exposure to sunlight.

1.7 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- D. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1. Warranty Term: 25 years.
 - 2. For repair and replacement include costs of both material and labor in warranty.
 - 3. Basic wind speed (3 second gust measured at 10 meters above ground level): 90 mph

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
 - 1. Carlisle Roofing Systems, Inc; FleeceBACK Fully Adhered TPO: www.carlisle-syntec.com/#sle.
 - 2. Johns Manville; JM TPO - 45 mil: www.jm.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation:
 - 1. Carlisle SynTec Systems; SecurShield Insulation: www.carlisle-syntec.com/#sle.
 - 2. GAF: www.gaf.com/#sle.
 - 3. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROOFING

- A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.
- B. Roofing Assembly Requirements:
 - 1. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value.
 - a. Calculate SRI in accordance with ASTM E1980.
 - b. Field applied coating may not be used to achieve specified SRI.
 - 2. Roof Covering External Fire Resistance Classification: UL (FRD) Class A.
 - 3. Insulation Thermal Resistance (R-Value): 5.7 per inch LTTR, minimum; provide insulation of thickness required to attain a minimum R-Value of 30.
- C. Acceptable Insulation Types - Tapered Application:
 - 1. Tapered polyisocyanurate board.

2.3 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

- A. Membrane Roofing Materials:
 - 1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrims.
 - a. Thickness: 60 mil, 0.060 inch, minimum.
 - 2. Sheet Width: Factory fabricated into widest possible sheets.
 - a. Adhered Application: Limit width to 120 inches, maximum, when ambient temperatures are less than 40 degrees F for extended period of time during installation.
 - 3. Color: Gray.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Vapor Retarder: Material approved by roof manufacturer complying with requirements of fire rating classification; compatible with roofing and insulation materials.
 - 1. Fire-retardant adhesive.
 - 2. Vapor Permeability: 0.05 perm inch, measured in accordance with ASTM E96/E96M.
 - 3. Products:
 - a. CCW-725 TR Air & Vapor Barrier / Temporary Roof manufactured by Carlisle Syntec.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

- D. Flexible Flashing Material: Same material as membrane.

2.4 DECK SHEATHING

- A. Deck Sheathing: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
 - 1. Thickness: 5/8 inch, Type X, fire-resistant.
 - 2. Products:
 - a. USG Corporation; Securock: www.usg.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 COVER BOARDS

- A. Cover Boards: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
 - 1. Thickness: 1/2 inch, fire-resistant.
 - 2. Products:
 - a. USG Corporation; Securock; www.usg.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 INSULATION

- A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
 - 1. Classifications:
 - a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
 - 1) Class 2 - Faced with coated glass fiber mat facers on both major surfaces of the core foam.
 - 2) Compressive Strength: Classes 1-2-3, Grade 2 - 20 psi (138 kPa), minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inches thick; Class 1, Grades 1-2-3, 8.4 (1.48), minimum, at 75 degrees F.
- 2. Board Size: 48 by 48 inches.
- 3. Board Thickness: 1.5 inch.
- 4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
- 5. Board Edges: Square.

2.7 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.
- C. Sheathing Joint Tape: Heat resistant type, 2 inches wide, self adhering.
- D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.
- E. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- F. Membrane Adhesive: As recommended by membrane manufacturer.
- G. Insulation Adhesive: As recommended by insulation manufacturer.
- H. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.
- I. Sealants: As recommended by membrane manufacturer.

- J. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Roofing membrane manufacturer's standard.
 - 2. Size: 30 by 30 inches.
 - 3. Surface Color: Gray.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2 INSTALLATION, GENERAL

- A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.
- B. Do not apply roofing membrane during cold or wet weather conditions.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.3 INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE

- A. Install vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
 - 1. Extend vapor retarder under cant strips and blocking to deck edge.
 - 2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
- B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
- C. Attachment of underlayment: Mechanically fasten insulation to metal deck
- D. Attachment of Insulation: Embed insulation in adhesive in full contact, in accordance with roofing and insulation manufacturers' instructions.
- E. Cover Boards: Adhere cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.
- F. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.

- G. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- H. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- I. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
- J. Do not install more insulation than can be covered with membrane in same day.

3.4 INSTALLATION - MEMBRANE

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate at rate of []anufacturer's published instructions for gal/sq ft. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Coordinate installation of roof drains and sumps and related flashings.

3.5 INSTALLATION - MEMBRANE FINISH COATING

- A. Install walkway pads. Space pad joints to permit drainage.

3.6 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.

3.7 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.8 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 54 00

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Sealants for joints within sheet metal fabrications.

1.2 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.
- C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).
- F. CDA A4050 - Copper in Architecture - Handbook; current edition.
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Perform work in accordance with ANSI/SPRI/FM 4435/ES-1 requirements for pull-off resistance to design wind pressure as defined by applicable local building code.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sheet Metal Flashing and Trim:
 - 1. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - 2. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 SHEET MATERIALS

- A. Pre-Finished Aluminum: ASTM B209/B209M; 20 gauge, 0.032 inch thick; plain finish shop pre-coated with silicone modified polyester coating.
 - 1. Fluoropolymer Coating: High performance organic powder coating, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
 - 2. Color: As selected by Architect from manufacturer's standard colors.

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- G. Fabricate flashings to allow toe to extend 2 inches over roofing membrane. Return and brake edges.

2.4 GUTTERS AND DOWNSPOUTS

- A. Gutters: SMACNA (ASMM), Rectangular profile.
- B. Downspouts: Rectangular profile.
- C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).
- D. Accessories: Profiled to suit gutters and downspouts.
 - 1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
 - 2. Gutter Supports: Brackets.
 - 3. Downspout Supports: Brackets.
- E. Downspout Boots: Cast iron.
- F. Seal metal joints.

2.5 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.

- B. Primer Type: Zinc chromate.
- C. Concealed Sealants: Non-curing butyl sealant.
- D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- E. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.3 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.
- E. Secure gutters and downspouts in place with concealed fasteners.
- F. Connect downspouts to downspout boots, and grout connection watertight.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 07 62 00

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.2 RELATED REQUIREMENTS

- A. Section 01 35 17 - Alteration Project Procedures: Cutting and patching.
- B. Section 07 05 53 - Fire and Smoke Assembly Identification.

1.3 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).
- C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).
- D. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013 (Reapproved 2017).
- E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- F. ITS (DIR) - Directory of Listed Products; Current Edition.
- G. FM (AG) - FM Approval Guide; Current Edition.
- H. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- I. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.
- J. UL (DIR) - Online Certifications Directory; Current Edition.
- K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.

1.5 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Trained by manufacturer.
 - 2. With minimum ten years documented experience installing work of this type.

1.6 MOCK-UPS

- A. Install one firestopping assembly representative of each fire rating design required on project.
 - 1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
- B. If accepted, mock-up will represent minimum standard for this work.
- C. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.7 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Firestopping Manufacturers:
 - 1. 3M Fire Protection Products: www.3m.com/firestop.
 - 2. A/D Fire Protection Systems Inc: www.adfire.com.
 - 3. Hilti, Inc: www.us.hilti.com.
 - 4. RectorSeal, a CSW Industrials Company: www.rectorseal.com/firestop-solutions/#sle.
 - 5. Specified Technologies Inc: www.stfirestop.com/#sle.
 - 6. United States Gypsum Co.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- C. Fire Ratings: Refer to drawings for required systems and ratings.

2.3 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
 - 1. Movement: Provide systems that have been tested to show movement capability as indicated.
- B. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
 - 1. Movement: Provide systems that have been tested to show movement capability as indicated.
 - 2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
 - 3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
 - 4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.
- C. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
 - 1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
 - 2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
 - 3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
 - 4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.4 FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

- A. Concrete and Concrete Masonry Walls and Floors:
 - 1. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
 - a. 2 Hour Construction: UL System HW-D-0755; 3M Co.; FireDam Spray 200.
- B. Gypsum Board Walls:
 - 1. Head-of-Wall Joints at Concrete Over Metal Deck:
 - a. 1 Hour Construction: UL System HW-D-0101, 3M Co.; FireDam Spray 200.

2.5 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

- A. Blank Openings:
 - 1. In Floors or Walls:
 - a. 2 Hour Construction: UL System C-AJ-0032; USG Inc.; Firecode Compound.
- B. Penetrations Through Floors or Walls By:
 - 1. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System C-AJ-1081; USG Inc.; Firecode Compound.
 - 2. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System C-AJ-22015; Rectorseal Sealant.
 - 3. Electrical Cables Not In Conduit:

- a. 3 Hour Construction: UL System C-AJ-3231; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
- b. 2 Hour Construction: UL System C-AJ-3045; USG Inc.; Firecode Compound.
- 4. Insulated Pipes:
 - a. 2 Hour Construction: UI System C-AJ-5002; 3M Company FS-195+ / CP 25WB+
- 5. HVAC Ducts, Uninsulated:
 - a. 2 Hour Construction: UL System C-AJ-7036; Rectorseal Sealant

2.6 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

- A. Blank Openings:
 - 1. 1 Hour Construction: UL System W-L-0031; 3M Company CP 25WB+
- B. Penetrations By:
 - 1. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 2 Hour Construction: UL System W-L-1001; 3M Company CP 25WB+
 - 2. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - a. 1 Hour Construction: UL System W-L-2088; 3M Company CP 25WB+ / FB-3000 WT
 - 3. Electrical Cables Not In Conduit:
 - a. 2 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
 - b. 1 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
 - c. 1 Hour Construction: UI System W-L-3195; 3M Company CP 25WB+
 - 4. Insulated Pipes:
 - a. 1 Hour Construction: UL System W-L-5039; 3M Company CP 25WB+
 - 5. HVAC Ducts, Insulated:
 - a. 1 Hour Construction: UL System W-L-7082; Rectorseal Sealants.

2.7 FIRESTOPPING SYSTEMS

- A. Manufacturers:
 - 1. A/D Fire Protection Systems, Inc. .
 - 2. Dow Corning Corp. .
 - 3. Hilti Corp. .
 - 4. 3M fire Protection Products .
 - 5. Rectorseal Corp.
 - 6. United States Gypsum Co. .
 - 7. Substitutions: Section 01 60 00 - Product Requirements .
- B. Firestopping:
 - 1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Install labeling required by code.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements.
- B. See Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- C. Inspect installed firestopping for compliance with specifications and submitted schedule.
- D. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.5 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 84 00

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.2 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 C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.
- G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.

1.3 SUBMITTALS

- A. See Section 01 30 00 - 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. Backing material recommended by sealant manufacturer.
 - 4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 5. Substrates the product should not be used on.
 - 6. Substrates for which use of primer is required.
 - 7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 - 8. Sample product warranty.
 - 9. Certification by manufacturer indicating that product complies with specification requirements.
- 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. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
- F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- H. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
- I. Manufacturer's qualification statement.
- J. Installer's qualification statement.
- K. Executed warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Allow sufficient time for testing to avoid delaying the work.
 - 4. Deliver sufficient samples to manufacturer for testing.
 - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
- E. Field Quality Control Plan:
 - 1. Visual inspection of entire length of sealant joints.
 - 2. Field testing agency's qualifications.
 - 3. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

1.5 WARRANTY

- A. See Section 01 78 00 - 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

2.1 MANUFACTURERS

- A. Nonsag Sealants:
 - 1. Dow: www.dow.com/#sle.
 - 2. Pecora Corporation: www.pecora.com/#sle.
 - 3. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints:
 - a. Seal the following joints:
 - 1) Wall expansion and control joints.
 - 2) Joints between doors, windows, and other frames or adjacent construction.
 - 3) Joints between different exposed materials.
 - 2. Interior Joints:
 - a. Seal the following joints:
 - 1) Joints between door frames and window frames and adjacent construction.
 - 2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
- B. Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.
 - 1. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane traffic-grade sealant.
- C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
 - 1. Wall and Ceiling Joints in Nonwet Areas: Acrylic emulsion latex sealant.
 - 2. Wall and Ceiling Joints in Wet Areas: Nonsag polyurethane sealant for continuous liquid immersion.

2.3 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 61 16.

2.4 NONSAG JOINT SEALANTS

- A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; 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 full range.
 - 6. Products:
 - a. Dow; DOWSIL 795 Silicone Building Sealant: www.dow.com/#sle.
 - b. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; multi-component; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 25 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 full range.
 - 4. Products:
 - a. Pecora Corporation; DynaFlex: www.pecora.com/#sle.
 - b. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 SELF-LEVELING JOINT SEALANTS

- A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
 - 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Hardness Range: 35 to 55, 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. Provide slope grade sealant at all sloped pavement up to 12%.

2.6 ACCESSORIES

- A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
- B. Sealant Backing Rod, Open-Cell Type:
 - 1. Cylindrical flexible sealant backings complying with ASTM C1330 Type O.
 - 2. Size: 25 to 50 percent larger in diameter than joint width.
- C. Sealant Backing Rod, Bi-Cellular Type:
 - 1. Cylindrical flexible sealant backings complying with ASTM C1330 Type B.
 - 2. Size: 25 to 50 percent larger in diameter than joint width.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.

3.2 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.

3.3 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.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION 07 92 00

SECTION 08 11 16
ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum monumental stile and rail doors.
- B. Aluminum frames.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between door frames and adjacent construction.
- B. Section 08 71 00 - Door Hardware: Hardware for aluminum doors.
- C. Section 08 80 00 - Glazing: Glazing materials for aluminum doors and frames.

1.3 REFERENCE STANDARDS

- A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
- C. AAMA 701/702 - Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals; 2011.
- D. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- F. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- I. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010 (Reapproved 2018).
- J. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- K. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.
- L. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- M. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- N. ITS (DIR) - Directory of Listed Products; Current Edition.
- O. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- P. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature for each type of door and frame; include information on fabrication methods, finishing, hardware preparation, installation, and maintenance instructions.
- C. Shop Drawings: Include elevations of each opening type, details at each wall type, and schedule of openings.
 - 1. Verify dimensions by field measurements before fabrication and indicate on shop drawings.
- D. Selection Samples: Complete set of color and finish options, using actual materials, for Architect's selection.
- E. Test Report: Certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years of documented experience.
- B. The manufacturer or his representative shall be available for consultation to all parties engaged in the project including instruction to installation personnel.
- C. Unless otherwise indicated, obtain doors and frames from a single company specializing in the type of construction required so that there will be undivided responsibility for the specified performance of all component parts including glazing for doors and factory installation of door hardware.
- D. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver aluminum components in manufacturer's standard protective packaging, palletted, crated, or banded together.
- B. Inspect delivered components for damage and replace. Repaired components will not be accepted.
- C. Store components in clean, dry, indoor area, under cover in manufacturer's packaging until installation.
- D. Protect materials and finish from damage during handling and installation.

1.7 FIELD CONDITIONS

- A. Do not begin installation of interior aluminum components until space has been enclosed and ambient thermal conditions are being maintained at levels consistent with final project requirements.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide written warranty signed by manufacturer, installer and contractor, agreeing to replace, at no cost to the Owner, any doors, frames or factory hardware installation against failure in materials or workmanship within the warranty period. Failure of materials or workmanship includes: excessive deflection, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware installation. The minimum time period of warranty is ten years from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Aluminum Monumental Stile and Rail Doors:
 - 1. Special-Lite, Inc; SL-15: www.special-lite.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Aluminum Frames:
 - 1. Special-Lite, Inc; SL-450TB: www.special-lite.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DOORS AND FRAMES

- A. Accessibility: Comply with ICC A117.1 and ADA Standards.
- B. Aluminum Monumental Stile and Rail Doors: Extruded aluminum, alloy 6063-T6 temper, with 1/8 inch minimum wall thickness, with mid-rail, and having full width galvanized steel 3/8 inch tie rods within top and bottom rails.
 - 1. Thickness: 1-3/4 inches, nominal.
 - 2. Stile Width: 4-3/4 inches, nominal.
 - 3. Top Rail Height: 6-1/2 inches, nominal.
 - 4. Bottom Rail Height: 10 inch, nominal.
 - 5. Mid-Rail Height: 8 inch, nominal.
 - 6. Finish: Class I - Natural anodized.
- C. Aluminum Frames for Non-rated Doors, Sidelights, or Transoms: Extruded aluminum, thermally broken hollow sections; no steel components; open back framing shall not be accepted.
 - 1. Frame Depth: 4-1/2 inches.
 - 2. Frames for Fire-Rated Doors Specified Elsewhere: Tested in accordance with NFPA 252, listed and labeled by UL (DIR), ITS (DIR), or testing agency acceptable to authorities having jurisdiction.
 - 3. Finish: Class I - Natural anodized.
 - 4. Weatherstripping: Replaceable pile type; at jambs and head.
 - 5. Sidelight/Transom Glazing: See Section 08 80 00.
- D. Dimensions and Shapes: As indicated on drawings; dimensions indicated are nominal.
 - 1. Provide vision lites as indicated on drawings.
 - 2. Provide the following clearances:
 - a. Hinge and Lock Stiles: 1/8 inch.
 - b. Between Meeting Stiles: 1/4 inch.
 - c. At Top Rail and Bottom Rail: 1/8 inch.

2.3 COMPONENTS

- A. Frames: Extruded aluminum shapes, not less than 0.125 inch thick, reinforced at hinge and strike locations.
 - 1. Corner Brackets: Extruded aluminum, fastened with stainless steel screws.
 - 2. Applied Door Stops: Extruded aluminum, not less than 0.125 inch thick, 0.625 high removable screw-in type with exposed fasteners.
 - a. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
 - b. At closer arm location, reinforce with solid bar stock for secure hardware attachment.
 - 3. Caulk joints before assembling frame members. Secure joints with fasteners and provide a hairline butt joint appearance. Prefit doors to frame assembly at factory prior to shipment. Field fabrication of framing using "stick" materials is not acceptable.
 - 4. Factory preassemble sidelights to greatest extent possible and mark frame assemblies according to location.
- B. Manufacture doors with cutouts for vision lites as scheduled. Factory finish and install all glazing prior to shipment.
- C. Vision Lites: Extruded aluminum framed, gasket glazed.
 - 1. Glazing: See Section 08 80 00.
- D. Astragals and Edges for Double Doors: Pairs of doors astragals, and door edge sealing and protection devices.
 - 1. Provide manufacturer's standard astragal to cover or fill space for full door height between pair of doors or door and adjacent jamb.
- E. Provide manufacturers standard concealed adjustable door bottom with dual brushes for up to 5/8-inch adjustment.
 - 1. Special-Lite SL-301 or equal.
- F. Additional Door Hardware: See Section 08 71 00.
 - 1. All hardware with the exception of door closer, threshold and weatherstripping to be shipped to door manufacturer. Door manufacturer shall install hardware on doors and warranty attachment for ten years. Complete fabrication, assembly, finishing and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.
- G. Replaceable Weatherstripping: AAMA 701/702 wool pile.

2.4 PERFORMANCE REQUIREMENTS

- A. Provide door assemblies that have been designed and fabricated in compliance with specified performance requirements.
- B. Fiberglass Reinforced Plastic (FRP) Face Sheet Properties; Class C:
 - 1. Izod Impact Resistance: ASTM D256, 7 ft lbf/inch of width, minimum, with notched izod.
 - 2. Tensile Strength at Break: ASTM D638, 18,000 psi, minimum.
 - 3. Water Absorption: ASTM D570, 0.16 percent, maximum, after 24 hours at 74 degrees F.
 - 4. Flexural Strength: ASTM D790, 27,000 psi, minimum.
- C. Fiberglass Reinforced Plastic (FRP) Face Sheet Properties; Class A:
 - 1. Izod Impact Resistance: ASTM D256, 4.0 ft lbf/inch of width, minimum, with notched izod.
 - 2. Tensile Strength at Break: ASTM D638, 7,000 psi, minimum.
 - 3. Water Absorption: ASTM D570, 0.16 percent, maximum, after 24 hours at 74 degrees F.
 - 4. Flexural Strength: ASTM D790, 14,000 psi, minimum.

2.5 MATERIALS

- A. Aluminum Sheet: ASTM B209/B209M, alloy 5005, temper H14, stretcher leveled.
- B. Extruded Aluminum: ASTM B221 (ASTM B221M), alloy 6063, temper T5, or alloy 6463, temper T5.

2.6 FINISHES

- A. Class I Natural Anodized Finish: Clear anodic coating; AAMA 611 AA-M12C22A41, minimum dry film thickness (DFT) of 0.7 mils, 0.0007 inch.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.7 ACCESSORIES

- A. Fasteners: Aluminum, non-magnetic stainless steel, or other material warranted by manufacturer as non-corrosive and compatible with aluminum components.
- B. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible, otherwise, non-magnetic stainless steel or steel hot-dip galvanized in compliance with ASTM A123/A123M.
- C. Bituminous Coating: Cold-applied asphaltic mastic, compounded for 30-mil thickness per coat.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that wall surfaces and openings are ready to receive frames and are within tolerances specified in manufacturer's instructions.
- B. Verify that frames installed by other trades for installation of doors of this section are in strict accordance with recommendations and approved shop drawings and within tolerances specified in manufacturer's instructions.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Perform cutting, fitting, forming, drilling, and grinding of frames as required for project conditions.
- B. Replace components with damage to exposed finishes.
- C. Separate dissimilar metals to prevent electrolytic action between metals.

3.3 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and approved shop drawings.
 - 1. Provide thermal isolation where components penetrate or disrupt building insulation. Coordinate attachment and seal of perimeter air and vapor retarder materials. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

- B. Set frames plumb, square, level, and aligned to receive doors. Anchor frames to adjacent construction in strict accordance with manufacturer's recommendations and within specified tolerances.
 - 1. Install with anchors appropriate for wall conditions to anchor framing to wall materials.
 - 2. Secure head and sill members of transom, sidelights and similar conditions.
 - 3. Maintain continuity of line and accurate relation of planes and angles. Secure attachments and support at mechanical joints with hairline fit at contacting members.
- C. Set thresholds in bed of mastic and backseal.
- D. Where aluminum surfaces contact metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by painting dissimilar metal with heavy coating of bituminous paint.
- E. Hang doors and adjust hardware to achieve specified clearances and proper door operation.
- F. Comply with glazing installation requirements. See Section 08 80 00.

3.4 CLEANING

- A. Upon completion of installation, thoroughly clean door and frame surfaces in accordance with AAMA 609 & 610.
- B. Do not use abrasive, caustic, or acid cleaning agents.

3.5 PROTECTION

- A. Protect products of this section from damage caused by subsequent construction until Date of Substantial Completion.
- B. Replace damaged or defective components that cannot be repaired to a condition indistinguishable from undamaged components.

END OF SECTION 08 11 16

SECTION 08 12 13
HOLLOW METAL FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-fire-rated hollow metal frames for non-hollow metal doors.
- B. Fire-rated hollow metal frames for non-hollow metal doors.
- C. Interior glazed borrowed lite frames.

1.2 RELATED REQUIREMENTS

- A. Section 08 14 16 - Flush Wood Doors: Non-hollow metal door for hollow metal frames.
- B. Section 08 71 00 - Door Hardware: Hardware, silencers, and weatherstripping.
- C. Section 08 80 00 - Glazing: Glazed borrowed lites.
- D. Section 09 91 23 - Interior Painting: Field painting.

1.3 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. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2016.
- K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- L. ITS (DIR) - Directory of Listed Products; Current Edition.
- 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.
- P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- Q. UL (DIR) - Online Certifications Directory; Current Edition.
- R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 30 00 - 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 grade standard.
- C. Samples: Submit one sample of frame metal, 2 by 2 inches, showing factory finishes, colors, and surface textures.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Hollow Metal Frames with Integral Casings:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 3. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Refer to Door and Frame Schedule on drawings for frame sizes, fire ratings, sound ratings, finishing, door hardware to be installed, and other variations, if any.
- B. Door Frame Type: Provide hollow metal door frames with integral casings.
- C. Steel Sheet: Comply with one or more of the following requirements; galvanized 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.

- D. Accessibility: Comply with ICC A117.1 and ADA Standards.
- E. 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 frame that is also indicated as being sound-rated must comply with the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, comply with the most stringent.
- F. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - 1. Fabricate frames with hardware reinforcement plates welded in place.
 - a. Hinge: Minimum 7 gauge x 1 5/8 x 10 inches.
 - b. Lock Strike: Minimum 14 gauge x template requirements.
- G. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.
- H. Transom Bars: Fixed, of profile same as jamb and head.
- I. Frames for Interior Glazing or Borrowed Lites: Construction and face dimensions to match door frames, and as indicated on drawings.
- J. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
- K. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into head of frame, and flush with top.

2.3 HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS

- A. Frame Finish: Factory primed and field finished.
- B. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
 - 2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inches above floor at 45 degree angle.
- C. Fire-Rated Door Frames: Full profile/continuously welded type.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
 - 2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C or NFPA 252 ("positive pressure fire tests").
 - 3. Temperature-Rise Rating (TRR) Across Framed Door Thickness: In accordance with local building code and authorities having jurisdiction.
 - a. Provide units listed and labeled by ITS (DIR) or UL (DIR).
 - b. Attach fire rating label to each fire rated unit.

2.4 FINISHES

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

2.5 ACCESSORIES

- A. 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.
- 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. Anchors:
 - 1. Stud Wall: Steel stud anchor.
 - 2. New Masonry: Adjustable masonry strap anchor.
 - 3. Existing Masonry: Counter sunk screw with sleeve.
 - a. Counter sunk fasteners shall be covered with a suitable hard setting filling compound, sanded and finished to match frame.

PART 3 EXECUTION

3.1 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.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Comply with glazing installation requirements of Section 08 80 00.
- F. Install door hardware as specified in Section 08 71 00.

3.4 TOLERANCES

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

3.5 SCHEDULE

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

END OF SECTION 08 12 13

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flush wood doors; flush configuration; fire rated and non-rated.

1.2 RELATED REQUIREMENTS

- A. Section 08 12 13 - Hollow Metal Frames.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.

1.3 REFERENCE STANDARDS

- A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- C. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- D. AWI (QCP) - Quality Certification Program; Current Edition.
- E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. ITS (DIR) - Directory of Listed Products; Current Edition.
- G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- H. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- J. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.
- K. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 6 by 6 inches in size illustrating wood grain, stain color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special installation instructions.

- F. Warranty, executed in Owner's name.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
- B. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
 - 1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Masonite Architectural: www.architectural.masonite.com/#sle.
 - 2. VT Industries, Inc: www.vtindustries.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DOORS

- A. Doors: See drawings for locations and additional requirements.
 - 1. Quality Standard: Custom Grade, Extra Heavy Duty performance, in accordance with WDMA I.S. 1A.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at each location.
 - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
 - 3. Wood veneer facing with factory transparent finish.

2.3 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.

- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.4 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: Maple, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, balance match of spliced veneer leaves assembled on door or panel face.
 - 1. Vertical Edges: Same species as face veneer.
 - 2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.
 - 3. Veneer to be hot press applied to core.

2.5 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- D. Fit door edge trim to edge of stiles after applying veneer facing. No exposed cross banding.
- E. Bond edge banding to cores.
- F. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- H. Provide edge clearances in accordance with the quality standard specified.

2.6 FINISHES - WOOD VENEER DOORS

- A. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
 - 1. Transparent:
 - a. System - TR-2, Catalyzed Lacquer.
 - b. Sheen: Flat.
- B. Factory finish doors in accordance with approved sample. Finish to match existing doors throughout the existing building.
- C. Seal door top edge with same sealer to match door facing.

2.7 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 08 12 13.
- B. Glazing Stops for non-rated doors: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.
- C. Glazing Stops for Fire Rated Doors: Metal as required by manufacturer to achieve fire rating. Field painted - color to be determined by Architect,
- D. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install fire-rated doors in accordance with NFPA 80 requirements and to requirements for fire rating label by UL or WH. Follow manufacturer's installation instructions for positive pressure doors.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.

3.3 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.4 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION 08 14 16

SECTION 08 16 13
FIBERGLASS DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass doors.
- B. Fiberglass door frames.
- C. Fiberglass borrowed lite frames.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.

1.3 REFERENCE STANDARDS

- A. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.
- C. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010 (Reapproved 2018).
- D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- E. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- F. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- K. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. ITS (DIR) - Directory of Listed Products; Current Edition.
- M. IBC 2603.4.1.7 - Standard for Plastic Foam Insulation in Non-Rated Swinging Doors.

- N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- O. UL (DIR) - Online Certifications Directory; Current Edition.
- P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Obtain hardware templates from hardware manufacturer prior to starting fabrication.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard details, installation instructions, hardware and anchor recommendations.
 - 1. Provide details of core, stile and rail construction, trim for lites and all other components.
 - 2. Include details of finish hardware mounting.
- C. Shop Drawings: Indicate layout and profiles; include assembly methods.
 - 1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
 - 2. Indicate wall conditions, door and frame elevations, sections, materials, gauges, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on drawings to identify details and openings.
- D. Submit two complete sets of color chips, illustrating manufacturer's available finishes, colors, and textures.
- E. Door Corner Sample: Submit corner cross sections, 10 inch by 10 inch in size, illustrating face sheets, core, framing, finish, joints, fasteners, accessory items (lites, integral hardware) and quality of workmanship for approval prior to fabrication.
- F. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Maintenance Data: Include instructions for repair of minor scratches and damage.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than 10 years of documented experience. Provide comprehensive list of completed projects of similar building type and size as this project with submittal package.
- B. The manufacturer or his representative shall be available for consultation to all parties engaged in the project including instruction to installation personnel.
- C. Unless otherwise indicated, obtain FRP doors and frames from a single company specializing in the type of construction required so that there will be undivided responsibility for the specified performance of all component parts including glazing for FRP doors and factory installation of door hardware.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Deliver pre-assembled doors and frames with braces, spreaders, and packaging as required to prevent damage.
- C. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
 - 1. Store at temperature and humidity conditions recommended by manufacturer.
 - 2. Do not use non-vented plastic or canvas shelters.
 - 3. Immediately remove wet wrappers.
- D. Store in position recommended by manufacturer, elevated minimum 4 inches above grade, with minimum 1/4 inch space between doors.

1.8 FIELD CONDITIONS

- A. Do not install doors until structure is enclosed.
- B. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide written warranty signed by manufacturer, installer and contractor, agreeing to replace, at no cost to the Owner, any doors, frames or factory hardware installation against failure in materials or workmanship within the warranty period. Failure of materials or workmanship includes: excessive deflection, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware installation. The minimum time period of warranty is ten (10) years from Date of Substantial Completion .

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fiberglass Composite Doors:
 - 1. Special-Lite, Inc; AF-220 Sandstone: www.special-lite.com/#sle.
 - 2. Or Approved Equal.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fire-Rated Fiberglass Doors and Frames:
 - 1. Special-Lite, Inc; AF-220FR Sandstone: www.special-lite.com/#sle.
 - 2. Or Approved Equal.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DOOR AND FRAME ASSEMBLIES

- A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
 - 1. Physical Endurance: Swinging door cycle test to ANSI/SDI A250.4, Level A (1,000,000 cycles) minimum; tested with hardware and fasteners intended for use on project.
 - 2. Screw-Holding Capacity: Tested to 890 pounds, minimum.

3. Surface Burning Characteristics: Flame spread index (FSI) of 0 to 25, Class A, and smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84.
 4. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
 5. Chemical Resistance: Resist degradation due to exposure to tap water and distilled water.
 6. Sizes: As indicated on drawings.
 7. Clearance Between Door and Frame: 1/8 inch, maximum.
 8. Clearance Between Meeting Stiles of Pairs of Doors: 1/8 inch, maximum.
 9. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.
 10. Provide frame anchors that allow for variation in rough opening size; field cutting of doors or frames to fit is not permitted.
- B. Fire-Rated Doors and Frames: Comply with fire-ratings as indicated on drawings.
1. Tested in accordance with ICC (IBC) for positive pressure or UL 10C.
 2. ITS (DIR) or UL (DIR) listed and labeled.
 3. Visible seals when doors are open or closed is not permitted.
 4. Provide mineral fiber or intumescent core as required for fire-rating as indicated.
 5. Manufacturer to supply smoke/draft and intumescent gasketing to meet positive pressure requirements.

2.3 COMPONENTS

- A. Doors: Fiberglass construction with reinforced core.
1. Type: As indicated on drawings, including swinging doors.
 2. Thickness: 1-3/4 inch, nominal.
 3. Core Material: Polypropylene (PP) honeycomb.
 4. Core Material: Mineral fiber, fire-rated doors, 18 pcf minimum density.
 5. Construction:
 - a. Fiberglass ultraviolet resistant mylar coated, with 1/8 inch thick through color face sheets laminated to core.
 - 1) Texture: Sandstone
 - 2) Color: As selected by Architect from manufacturer's full range of colors
 6. Door Panel Configuration: As indicated on drawings.
 7. Subframe and Reinforcements: Fiberglass pultrusions; no metal or wood.
 8. Waterproof Integrity: Provide factory fabricated edges, cut-outs, and hardware preparations of fiberglass reinforced plastic (FRP); provide cut-outs with joints sealed independently of glazing, louver inserts, or trim.
 9. Hardware Preparations: Factory reinforce, machine, and prepare for door hardware including field installed items; provide solid blocking for each item; field cutting, drilling or tapping is not permitted; obtain manufacturer's hardware templates for preparation as necessary.
 10. Provide manufacturer's standard concealed adjustable door bottom with dual brushes for up to 5/8" adjustment, at exterior doors only.
- B. Door and Borrowed Lite Frames: Provide type in compliance with performance requirements specified for doors.
1. Type: Factory assembled with chemically welded joints.
 2. Profiles: As indicated on drawings.
 3. Door Stop: 5/8 inch wide, by 1-7/8 inches deep.
 4. Non-Fire-Rated:
 - a. Fiberglass pultrusions with factory finish.
 5. Fire-Rated: Provide frames bearing labels to match doors.
 - a. Fiberglass pultrusions primed for field painting.
 - 1) See Section 09 91 13 and 09 91 23 for additional painting requirements.
 6. Mullions: Removable, fiberglass centerpost; 2 inches wide by 5-3/4 inches deep, nominal.

7. Corner Joints: Mitered with concealed corner blocks or angles of same material as frame; fiberglass joined with screws; sealed watertight with silicone sealant; field assemble knock-down type frames as required.
 - a. Allow for thermal expansion on exterior units.
8. Hardware Cut-outs: Provide continuous backing or mortar guards of same material as frame, with watertight seal.
9. Frame Anchors: Stainless steel, Type 304; provide three anchors in each jamb for heights up to 84 inches with one additional anchor for each additional 24 inches in height.
10. Reinforcing: Provide manufacturer's standard reinforcing at hinge, strike, and closer locations.

2.4 PERFORMANCE REQUIREMENTS

- A. Provide door assemblies that have been designed and fabricated in compliance with specified performance requirements.
- B. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 7.5 psf.
- C. Air Leakage: Maximum 0.1 cfm/sf, when tested in accordance with ASTM E283/E283M at differential pressure of 6.24 psf across assembly.
- D. Structural Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
- E. Thermal Transmittance, Exterior Doors: AAMA 1503, U-value of 0.35, maximum, measured on exterior door in size required for this project.
- F. Fiberglass Reinforced Plastic (FRP) Face Sheet Properties:
 1. Izod Impact Resistance: ASTM D256, 7 foot-pound force per inch of width, minimum, with notched izod.
 2. Water Absorption: ASTM D570, 0.16 percent, maximum, after 24 hours at 74 degrees F.
 3. Flexural Strength: ASTM D790, 27,000 psi, minimum.

2.5 FINISHES

- A. Abuse resistant engineered surface with protective coating and through-molded color.
 1. Panel Texture: Sandstone.
 2. Color: As selected by Architect from manufacturer's full line of colors.

2.6 HARDWARE

- A. Door Hardware: See Section 08 71 00.
 1. Pre-machine doors in accordance with templates from specified hardware supplier.

2.7 ACCESSORIES

- A. Fasteners: Stainless steel or other non-corrosive metal fasteners, guaranteed by the manufacturer to be compatible with door and frame
- B. Stops for Glazing: Fiberglass, unless otherwise indicated or required by fire rating; provided by door manufacturer to fit factory made openings, with color and texture to match door; fasteners shall maintain waterproof integrity.
 1. Exterior Doors: Provide non-removable stops on exterior side with continuous compression gasket weatherseal.
 2. Glazed Openings: Provide removable stops on interior side.
 3. Fire-Rated Doors: Provide stop kit listed by labeling authority.
 4. Opening Sizes and Shapes: As indicated on drawings.

- C. Glazing: See Section 08 80 00.
 - 1. Design system for replacement of glazing
 - 2. Allow for thermal expansion on exterior units.
 - 3. Glazing shall be factory glazed into doors.

2.8 FABRICATION

- A. Field measure before fabrication and show recorded measurements on final shop drawings.
- B. Maintain continuity of line and accurate relation of planes and angles. Secure attachments and support at mechanical joints with hairline fit at contacting members.
- C. All hardware with the exception of door closer, threshold and weatherstripping to be shipped to door manufacturer. Door manufacturer shall install hardware on doors and warranty attachment for ten years. Complete fabrication, assembly, finishing and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify actual dimensions of openings by field measurements before door fabrication; show recorded measurements on shop drawings.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Remove existing doors and frames, and dispose of all removed materials in accordance with local authorities having jurisdiction.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean and prepare substrate in accordance with manufacturer's directions.
- D. Protect adjacent work and finish surfaces from damage during installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.
- B. Install fire-rated assemblies in accordance with NFPA 80.
- C. Install door hardware as specified in Section 08 71 00.
- D. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.
- E. Set thresholds in continuous bed of sealant and backseal.
- F. In masonry walls, install frames prior to laying masonry; anchor frames into masonry mortar joints; fill jambs with grout as walls are laid up.

- G. In stud walls, install frames prior to building walls; anchor frames to studs using concealed anchors.
- H. Separate aluminum and other metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- I. Provide thermal isolation where components penetrate or disrupt building insulation. Coordinate attachment and seal of perimeter air and vapor retarder materials. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Repair or replace damaged installed products.

3.4 ADJUSTING

- A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.
- B. Adjust hardware for smooth and quiet operation.
- C. Adjust doors to fit snugly and close without sticking or binding.

3.5 CLEANING

- A. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
- B. Do not use harsh cleaning materials or methods that would damage finish.

3.6 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 16 13

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall- and ceiling-mounted access units.

1.2 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions.
- B. Section 09 91 23 - Interior Painting: Field paint finish.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. 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.
- C. 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.
- D. ITS (DIR) - Directory of Listed Products; Current Edition.
- E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- F. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, fire resistance listings, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.
- E. Project Record Documents: Record actual locations of each access unit.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.
 - 1. Provide for access to controls, valves, traps, dampers, cleanouts, and similar items requiring operation behind inaccessible finished surfaces.
 - 2. Coordinate exact locations with various trades to assure proper placement of access doors and panels.
- B. Wall-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Panel Material: Steel.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
- C. Fire-Rated Wall-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Wall Fire-Rating: To match rating of assembly in which unit is installed .
 - 3. Panel Material: Steel.
 - 4. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- D. Ceiling-Mounted Units:
 - 1. Location: As indicated on drawings, and additional locations as required.
 - 2. Panel Material: Steel.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.2 WALL- AND CEILING-MOUNTED ACCESS UNITS

- A. Manufacturers:
 - 1. ACUDOR Products Inc: www.acudor.com/#sle.
 - 2. Cendrex, Inc: www.cendrex.com/#sle.
 - a. Wall- and Ceiling-Mounted Units: Cendrex AHD, flush door, face frame, hinged.
 - b. Fire-Rated Ceiling-Mounted Units: Cendrex PFI-00 Fire-Rated Insulated Access Door with Exposed Flange.
 - 3. Karp Associates, Inc: www.karpinc.com/#sle.
 - 4. Milcor, Inc: www.milcorinc.com.
 - 5. Nystrom, Inc: www.nystrom.com/#sle.
- B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
 - 1. Style: Exposed frame with door surface flush with frame surface.
 - a. Gypsum Board Ceiling Mounting Criteria: Use drywall bead type frame.
 - 2. Door Style Non-rated: Single thickness with rolled or turned in edges.
 - 3. Door Style Fire-Rated: Double-skinned hollow panel, insulated.
 - a. Insulation: Non-combustible mineral wool.
 - 4. Frames: 16-gauge, 0.0598-inch minimum thickness.
 - 5. Single Steel Sheet Door Panels: 16 gage, minimum thickness.
 - 6. Double-Skinned Hollow Steel Sheet Door Panels: 20 gage, .0359 inch, minimum thickness, on both sides and along each edge.
 - 7. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.

- a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
- b. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
- 8. Steel Finish: Primed.
- 9. Factory Primed: Polyester powder coat.
- 10. Hardware:
 - a. Hardware for Fire-Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Continuous piano hinge.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.3 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings with plane of door and panel face aligned with adjacent finished surfaces. Secure rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.
- D. Install fire rated units in accordance with NFPA 80 and requirements for fire listing.

END OF SECTION 08 31 00

SECTION 08 36 13
SECTIONAL DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Overhead uninsulated sectional doors, manually operated.
- B. Operating hardware and supports.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.3 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- B. DASMA 102 - American National Standard Specifications for Sectional Doors; 2018.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- C. Product Data: Show component construction, anchorage method, and hardware.
- D. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.
- E. Operation Data: Include normal operation, troubleshooting, and adjusting.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Comply with applicable code for motor and motor control requirements.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction, as suitable for purpose specified.

1.6 WARRANTY

- A. Furnish ten year warranty for door panels against delamination of insulation from steel skin.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sectional Doors:
 - 1. C.H.I. Overhead Doors: www.chiohd.com/#sle.
 - 2. Overhead Door Corporation; Model 430 - Sectional Steel Door: www.overheaddoor.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.

2.3 STEEL DOORS

- A. Steel Doors: Stile and rail steel with solid panels; low headroom operating styles with track and hardware; complying with DASMA 102, Commercial application.
 - 1. Door Panels: Stile and rail construction, of steel sheet 0.058 inch minimum thickness, with welded joints; rabbeted weather joints at meeting rails.
 - 2. Door Nominal Thickness: 2 inches thick.
 - 3. Exterior Finish:
 - a. Factory finished with acrylic baked enamel; color as selected by Architect.
 - 4. Interior Finish:
 - a. Factory finished with acrylic baked enamel; color as selected from manufacturers standard line.
 - 5. Manual Operation: Chain hoist.

2.4 COMPONENTS

- A. Track: Rolled galvanized steel, 11 gage thick; 2 inch wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick, min. Provide type of track recommended by manufacturer to suit clearances available. Primarily standard lift in bus storage bays and high lift in maintenance bays.
- B. Hinge and Roller Assemblies: Heavy duty hinges and graduated roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.
- C. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.
- D. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with heavy duty EPDM resilient weatherstripping, placed in moderate contact with door panels. Color to match door.
- E. Head Weatherstripping: EPDM rubber seal, one piece full length.
- F. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.
- G. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior and exterior handle.
- H. Lock Cylinders: Master keyed to building keying system.

2.5 MATERIALS

- A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating, plain surface.
- B. Metal Primer Paint: Zinc molybdate type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits prior to starting installation.

3.2 PREPARATION

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.
- B. Apply primer to wood frame.

3.3 INSTALLATION

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Install perimeter trim and weatherstripping.

3.4 TOLERANCES

- A. Maximum Variation from Plumb: 1/16 inch.
- B. Maximum Variation from Level: 1/16 inch.
- C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.
- D. Maintain dimensional tolerances and alignment with adjacent work.

3.5 ADJUSTING

- A. Adjust door assembly for smooth operation and full contact with weatherstripping.
- B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.6 CLEANING

- A. Clean doors and frames.
- B. Remove temporary labels and visible markings.

3.7 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 36 13

SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.

1.2 RELATED REQUIREMENTS

- A. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.3 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- I. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- K. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.
- L. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- G. Manufacturer's qualification statement.
- H. Submit NFRC 100 - CMA Bid Report for the project showing compliance with the project thermal requirements at time of initial submission. Bid report shall be based on NFRC test sizes utilizing project specific glazing.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of New York.
- B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- C. Single Source Requirement: Unless otherwise indicated, obtain aluminum doors and storefront from a single company specializing in the type of construction required so that there will be undivided responsibility for the specified performance of all component parts. Manufacturer to fabricate storefront frames to greatest extent allowing for minimal field fabrication.
- D. Hardware Attachment Fasteners: All hardware to be attached using machine fasteners only. Use of thread forming fasteners is not acceptable.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Warrant doors, storefront frames and factory supplied hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation and deterioration in finish or construction in excess of normal weathering.
- C. Hardware Attachment: The workmanship and materials involved with the installation of hardware by the door manufacturer is guaranteed to be free of defects. Door Manufacturer shall install all hardware, except door closers. Hardware supplied with doors and frames shall be covered by the hardware manufacturer's standard warranty.
- D. Warranty Terms:

1. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
2. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
3. Provide Ten year warranty on attachment of factory installed hardware.
4. Cover complete system for failure to meet requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Aluminum-Framed Storefronts:
1. EFCO, a Pella Company: www.efcocorp.com.
 2. Kawneer North America: www.kawneer.com/#sle.
 3. Special-Lite: www.special-lite.com.
 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
1. Glazing Rabbet: For 1/4 inch insulating glazing.
 2. Glazing Position: center.
 3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
 4. Finish: Class I natural anodized.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 5. Finish Color: As selected by Architect from manufacturer's standard line.
 6. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 9. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 11. Thermal Performance: Installed system shall conform to the following minimum standards:
 - a. Fabricator will be required to thermally model each head, sill and jamb, including adjacent construction, using thermal computer modeling software by an NFRC certified simulator to conform to the following:
 - 1) Inside air temperature of 72 degrees F at 30 percent RH and an outside air temperature of -10 degrees F with a 15 mph wind speed.
 - b. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in NFRC 100.

B. Performance Requirements

1. Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load or loads based on 120 mph wind speed, whichever is greater.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
3. Overall U-Value Including Glazing: .36 Btu/ sq ft per hour per degree F, maximum, based on glass/spacer per specification section 08 80 00, and based on NFRC 100 sizes. Labeled and certified by manufacturer.
 - a. Provide CMA NFRC Label certificate at close out of project.
 - b. Provide CMA Bid Report as submittal prior to release to verify compliance.
 - c. All testing shall be completed using specified glazing.
 - d. CMA Report is for framing only, not the entrance doors.

2.3 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Framing members for interior applications need not be thermally broken.
 2. Glazing Stops: Flush.
 3. Door stops: Supply screw applied door stops of .625-inch height with pile weather strip. At closer shoe location provide ½-inch solid aluminum bar stock for secure hardware attachment.
 4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel members as required.
 5. Supply expansion mullions as required to accommodate seasonal expansion and contraction of systems.
 6. Manufacturer to fabricate storefront frames to greatest extent possible.
- B. Preformed Aluminum Trim Covers: Provide preformed aluminum trim at new exterior frames where new frames meet existing construction to achieve a finished look. Dimensions to be verified in the field.

2.4 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M); 6063 alloy, T5 temper typical. 6061 alloy, T6 temper for extruded structural members.
- B. Sheet Aluminum: ASTM B 209 (ASTM B209M); 5005 alloy, H15 or H34 temper.
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Fasteners: Stainless steel.
- E. Exposed Flashings: 0.062 inch thick aluminum sheet; finish to match framing members.
- F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- G. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
- H. Self-sticking labels compliant with Industrial Code Rule No. 47: Transparent glass doors, fixed adjacent transparent glass sidelights and full height window systems shall be marked in two areas on the glass surface thereof. One such area shall be located at least 30, but not more

than 36 inches and the other at least 60, but not more than 66 inches above the ground, The marking design shall be at least four inches in diameter if circular or four inches in its least dimension if elliptical or polygonal. or shall be at least 12 inches in horizontal dimension if the marking is less than four inches in its least dimension. In no event shall the vertical dimension of any marking including lettering be less than one and one-half inches in height.

2.5 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- B. Color: As selected by Architect from manufacturer's standard range.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 FIELD QUALITY CONTROL

- A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

3.5 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.

3.6 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 43 13

SECTION 08 45 00
TRANSLUCENT WALL AND ROOF ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plastic glazed translucent wall system.

1.2 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: Roof support structure.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between perimeter frame and adjacent construction.

1.3 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- D. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- E. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics; 2021.
- F. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2022.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, panel configuration, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, weep drainage network, expansion and contraction joint locations and details, and required field welding.

- D. Samples: Two Samples, 12 by 12 inches in size, illustrating prefinished aluminum surface, specified panel with skins, glazing materials illustrating edge and corner.
- E. Design Data: Show structural and physical characteristics, engineering calculations, and dimensional limitations.
- F. Test Reports: Substantiating engineering data, test results of previous tests by independent laboratory demonstrating compliance with performance requirements.
- G. Installation Data: Special installation requirements.
- H. Manufacturer's qualification statement.
- I. Installer's qualification statement.
- J. Specimen warranty.

1.5 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 the work of this section with at least three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store panels on long edge above ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.7 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and after installation of sealants.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 10-year manufacturer warranty against deterioration of interior and exterior polycarbonate glazing panes. Complete forms in Owner's name and register with manufacturer. Include coverage for the following characteristics:
 - 1. Change in Light Transmission: No greater than 6 percent when tested in accordance with ASTM D1003.
- C. Manufacturer Warranty: Provide 20-year manufacturer warranty against excessive degradation of exterior finish; include provision for replacement of units with excessive cracking, peeling, and adhesion failure of finish. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Solid Plastic Panel - Translucent Roof Systems:
 - 1. Palram Americas, Inc; SUNPAL® MULTIWALL POLYCARBONATE ARCHITECTURAL SYSTEM: www.palram.com/#sle; www.palram.com/#sle.

2. Kingspan; Briteway® Canopy System: www.kingspan.com/us/en/.
3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 DESIGN CRITERIA

- A. System Design: Design and size assemblies and their components to withstand dead loads and live loads caused by snow, hail, and positive and negative wind loads acting on plane of panel without damage or permanent set.
 1. Regulatory Requirements: Comply with applicable code criteria for loads, including seismic loads.
 2. Design Loads: As indicated on drawings.

2.3 PERFORMANCE REQUIREMENTS

- A. Measure structural performance in accordance with ASTM E330/E330M, using test load of 1.5 times the design wind pressure and 10 second duration of maximum load.
- B. Deflection: Limit panel mullion deflection to L/60 with full recovery of glazing materials.
- C. System Assembly: Accommodate without damage to system, components or deterioration of seals; movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; deflection of structural support framing, tolerance of supporting components, shortening of building concrete structural columns.
- D. Color Stability: Color of exterior face sheet to not change color more than three CIE Units DELTA E in accordance with ASTM D2244 after 3 years outdoors in South Florida weathering facing south; color stability is not affected by abrasion or scratching.
- E. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 25 or less for canopies when tested in accordance with ASTM E84 or UL 723.
- F. Expansion/Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components.
- G. System Internal Drainage: Drain water entering joints, condensation occurring in framing system, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- H. Fabricate to prevent vibration harmonics, thermal movement transmitted to other building elements, and loosening, weakening, or fracturing of attachments or components of system.

2.4 SYSTEMS

- A. General: Shop-fabricated, factory-prefinished facade and roof systems consisting of various types of translucent assemblies, internal and external framing components, accessories, related flashings, anchorages, and attachments.
- B. Solid Plastic Panel Wall Systems: Single-glazed using standing seam panels with self-supporting panels and aluminum batten joiners.
 1. Glazing Rafters and Caps: Manufacturer's standard.

2.5 ASSEMBLIES

- A. Flat Solid Panel Assemblies: Extruded in one single formable length.
 1. Flat Panels: Manufactured by extrusion without upstands.
 2. System Thermal Expansion and Contraction Response: Allowing free-floating movement after installation.
 3. Panel Width: 24 inches.

- 4. Panel Thickness: 5/8 inch.
- B. Support Framing Members: 2 inch wide by 2 inch deep profile; of minimum 0.125 inch thick extruded aluminum. Extruded aluminum shall be ANSI/ASTM B-221; 6063-T5/T6, 6005-T5 or 6061-T5/T6
- C. Battens, Cover Strips, Cover Plates, and Integral Flashings: Extruded aluminum, to suit location and application; sized to rigidly retain panels in place.
- D. Flashings: 0.040 inch thick aluminum, finish to match translucent panel mullion sections where exposed, secured with concealed fastening method.
- E. Sealant Within Translucent Assembly: As required by manufacturer; see Section 07 92 00.

2.6 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Solid Polycarbonate Sheets: Ultraviolet (UV) protected.
 - 1. Light Transmittance, Clear, Transparent Sheet: 80 percent, determined in accordance with ASTM D1003.

2.7 FABRICATION

- A. Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, and ensure proper installation and dynamic movement of perimeter seals.
- B. Accurately fit and secure joints and corners. Make joints flush and hairline.
- C. Prepare components to receive fabricated anchor devices.
- D. Locate fasteners and attachments to ensure concealment from view.
- E. Reinforce framing members for external imposed loads.

2.8 FINISHES

- A. Aluminum Materials:
 - 1. Superior Performing Organic Coatings: AAMA 2605; multiple coat, thermally cured polyvinylidene fluoride system.
 - 2. Color: To be selected by Architect from manufacturer's standard range.
 - 3. Touch-Up Materials: As recommended by coating manufacturer for field application.
- B. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.

3.2 SURFACE PREPARATION

- A. Where aluminum contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

3.3 INSTALLATION

- A. Install translucent panel system with cells vertical in accordance with manufacturer instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

3.4 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down interior and exterior surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths; remove dirt from corners and wipe surfaces clean.

3.5 PROTECTION

- A. Protect finished work from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section references specification sections relating to commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding Doors.
 - 3. Other doors to the extent indicated.
- B. Commercial door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical and access control door hardware.
 - 3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
 - 4. Automatic operators.
 - 5. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Door Hardware".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service

representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.6 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Refer to "PART 3 – EXECUTION" for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

- A. The door 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

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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.
 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.
1. Section 08 71 00 – Door Hardware.
- C. Manufacturer's Abbreviations:
1. MK - McKinney
 2. PE - Pemko
 3. RO - Rockwood
 4. SA - SARGENT
 5. RU - Corbin Russwin
 6. SC - Schlage
 7. HS - HES
 8. RF - Rixson
 9. OT - Other
 10. YA - ASSA ABLOY ACCENTRA
 11. SU - Securitron

Hardware Sets

Set: 1.0

Doors: NOT USED

1	Door - Frame - Hardware	NOT USED	OT
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Set: 2.0

Doors: D102A-1, D102A-2

1	All Hardware	BY DOOR SUPPLIER		OT
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Set: 3.0

Doors: C115-1, C115-2, C115-3, C115-4

1	Continuous Hinge	CFM__HD1-M x DOOR HEIGHT		PE	087100
1	Rim Exit Device	PED5257 M52 N857PT	630	RU	087100
2	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC	087100
2	Cylinder Housing	Schlage as required	.626	SC	087100
1	Conc Overhead Stop	1-X36	630	RF	087100
1	Surface Closer	DC6210 M77 (or) M78 as required	689	RU	087100
1	Perimeter/Mtg Stile Seal	BY FRAME / DOOR SUPPLIER		OT	
1	Sweep (w/drip edge)	3452CNB x Width of Door		PE	087100
1	Threshold	278x292AFGPK MSES25SS x Width of Opening		PE	087100

Set: 4.0

Doors: DX103-2, DX103-4

2	Continuous Hinge	CFM__SLF-HD1-M x DOOR HEIGHT		PE	087100
1	Removable Electrified Mullion	EL980 x Height of Opening	PC	SA	087100 ⚡
1	Rim Exit Device, Nightlatch	PED5257 M52 K157ET	630	RU	087100
1	Rim Exit Device, Exit Only	PED5201 M52 EO	630	RU	087100
4	Keyed Cylinder	SFIC (Match existing	.626	SC	087100

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4	Cylinder Housing	keying system) Schlage as required	.626	SC	087100	
1	Mullion Cylinder Kit	980C1	US26D	SA	087100	
2	Bridge Rectifier	2005M3		HS	087100	⚡
2	ElectroLynx Adaptor	2004M		HS	087100	⚡
2	Electric Strike	9600	630	HS	087100	⚡
2	Door Pull	RM5277-12	US32D	RO	087100	
2	Conc Overhead Stop	1-X36	630	RF	087100	
2	Surface Closer	DC6210 M77 (or) M78 as required	689	RU	087100	
1	Perimeter/Mtg Stile Seal	BY FRAME / DOOR SUPPLIER		OT		
1	Gasketing (mullion)	5110BL x Height of Opening		PE	087100	
2	Sweep (w/drip edge)	3452CNB x Width of Door		PE	087100	
1	Threshold	278x292AFGPK MSES25SS x Width of Opening		PE	087100	
2	Frame Harness	QC-C1500P		MK	087100	⚡
1	Wiring Diagram	WD-SYSPK (Point to Point & Riser)		YA	087100	
1	Card Reader	BY DIVISION 28		OT		⚡
2	Door Position Switch	DPS-M-BK		SU	087100	⚡
1	Motion Sensor (REX)	BY DIVISION 28		OT		⚡
1	Power Supply	AQL4-R8E1		SU	087100	⚡

Notes: Operational Narrative:

1. Doors normally closed and secure.
2. Authorized access by card reader releasing electric strike. Strike can remain released for open access.
3. Egress free for immediate exit.
4. Door position switch monitors door open/closed/latched status.
5. Electric strike remains locked (fail secure) in event of power loss. Keyed cylinder override for emergency access.

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Set: 5.0

Doors: C111B-1, C113B-1

1	Continuous Hinge	CFM__HD1-M x DOOR HEIGHT		PE	087100
1	Pull Plate	BF 110x70C	US32D	RO	087100
1	Push Plate	70C-RKW	US32D	RO	087100
1	Surface Closer	DC6210 M77 (or) M78 as required	689	RU	087100
1	Wall Stop	403	US26D	RO	087100

Set: 6.0

Doors: C115A-1

1	Continuous Hinge	CFM__HD1-M x DOOR HEIGHT		PE	087100
1	Entrance Lock	CLX3351 NZD M08	626	RU	087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC	087100
1	Conc Overhead Stop	6-X36	630	RF	087100

Set: 7.0

Doors: C111A-1, C113A-1

1	Continuous Hinge	CFM__HD1-M x DOOR HEIGHT		PE	087100
1	Privacy Lock (w/Indicator)	CLX3320 NVSL V33	626	RU	087100
1	Conc Overhead Stop	6-X36	630	RF	087100

Set: 8.0

Doors: C123-1

1	Storeroom Lock	CLX3357 NZD M08	626	RU	087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC	087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU	087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO	087100

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Notes: Balance of existing hardware to remain. Hardware supplier must field verify that the specified hardware will operate correctly on these existing doors.

Set: 9.0

Doors: [C114-1](#)

3	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Classroom Lock	CLX3355 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
1	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1	Wall Stop	403	US26D	RO 087100
1	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE 087100

Set: 10.0

Doors: [C112-1](#)

3	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Classroom Lock	CLX3355 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
1	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1	Wall Stop	403	US26D	RO 087100
1	Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

Set: 11.0

Doors: [C110-1](#)

6	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Flush Bolt	2940	US26D	RO 087100

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	(automatic)			
1	Classroom Lock	CLX3355 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Coordinator	1700	Black	RO 087100
2	Conc Overhead Stop	6-X36	630	RF 087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1	Astragal	S771C x Height of Door		PE 087100
2	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE 087100

Notes: Install flush bolt at top of inactive leaf only.

Set: 12.0

Doors: E113-1

6	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Flush Bolt (automatic)	2940	US26D	RO 087100
1	Classroom Lock	CLX3355 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Coordinator	1700	Black	RO 087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
2	Wall Stop	403	US26D	RO 087100
1	Astragal	S771C x Height of Door		PE 087100
2	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE 087100

Notes: Install flush bolt at top of inactive leaf only.

Set: 13.0

Doors: C114-2, DX103-1

6	Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP)	US26D	MK 087100
1	Surface Vert Rod	PED5455 A N8M55PT	630	RU 087100

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Exit	M55		
1 Surface Vert Rod Exit, Exit Only	PED5401 A EO M55	630	RU 087100
1 Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1 Cylinder Housing	Schlage as required	.626	SC 087100
2 Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2 Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
2 Wall Stop	403	US26D	RO 087100
1 Astragal	S771C x Height of Door		PE 087100
1 Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

Set: 14.0

Doors: S105.1

1 All Hardware	BY DOOR SUPPLIER	OT
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Notes: All hardware to be provided by the fire rated aluminum door and frame supplier.

Set: 15.0

Doors: D111-5, D111-6

6 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP)	US26D	MK 087100
1 Removable Mullion	12-L980 x Height of Opening	PC	SA 087100
2 Rim Exit Device	PED5255 A N855PT	630	RU 087100
3 Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
3 Cylinder Housing	Schlage as required	.626	SC 087100
1 Mullion Cylinder Kit	980C1	US26D	SA 087100
2 Conc Overhead Stop	1-X36	630	RF 087100
2 Surface Closer	DC6210 M77 (or) M78 as required	689	RU 087100
2 Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1 Astragal	S771C x Height of Door		PE 087100
1 Perimeter/Mtg Stile Seal	BY FRAME / DOOR SUPPLIER		OT

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Set: 16.0

Doors: [DX103-3](#)

6	Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP)	US26D	MK 087100
1	Removable Mullion	12-L980 x Height of Opening	PC	SA 087100
2	Rim Exit Device	PED5255 A N855PT	630	RU 087100
3	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
3	Cylinder Housing	Schlage as required	.626	SC 087100
1	Mullion Cylinder Kit	980C1	US26D	SA 087100
2	Conc Overhead Stop	1-X36	630	RF 087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1	Astragal	S771C x Height of Door		PE 087100
1	Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

Set: 17.0

Doors: [D126-1](#), [D126C-1](#)

3	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Storeroom Lock	CLX3357 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Surface Closer	DC6210 A4	689	RU 087100
1	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1	Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

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Set: 18.0

Doors: [D111-1](#)

6	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Dust Proof Strike	570	US26D	RO 087100
2	Flush Bolt (manual)	555 / 557	US26D	RO 087100
1	Entrance Lock	CLX3351 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
2	Wall Stop	403	US26D	RO 087100
2	Silencer (HM / WD)	608 (or) 609		RO 087100

Set: 19.0

Doors: [D111-4](#)

6	Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1	Dust Proof Strike	570	US26D	RO 087100
1	Flush Bolt (automatic)	2842 / 2942	US26D	RO 087100
1	Storeroom Lock	CLX3357 NZD M08	626	RU 087100
1	Keyed Cylinder	SFIC (Match existing keying system)	.626	SC 087100
1	Coordinator	1700	Black	RO 087100
2	Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
2	Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
2	Wall Stop	403	US26D	RO 087100
1	Astragal	S771C x Height of Door		PE 087100
1	Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

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Set: 21.0

Doors: D126A-1, D126B-1, D126D-1, D126E-1, D126F-1, D126G-1

3 Hinge, Full Mortise	TA2714 (NRP)	US26D	MK 087100
1 Privacy Lock (w/Indicator)	CLX3320 NVSL V33	626	RU 087100
1 Surface Closer	DC6200 (or) DC6210 (as required)	689	RU 087100
1 Kick Plate	K1050 10" CSK BEV	US32D	RO 087100
1 Wall Stop	403	US26D	RO 087100
1 Gasketing (head/jamb)	S88BL x Head & Jambs		PE 087100

END OF SECTION 080671

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 14 16 - Flush Wood Doors: Glazed lites in non-rated doors.
- C. Section 08 16 13 - Fiberglass Doors: Glazed lites in non-rated doors.
- D. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

1.3 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- G. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
- H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- I. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- J. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2021.
- K. GANA (GM) - GANA Glazing Manual; 2022.
- L. GANA (SM) - GANA Sealant Manual; 2008.
- M. GANA (LGRM) - Laminated Glazing Reference Manual; 2019.
- N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.
- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2020.
- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.
- R. UL 972 - Standard for Burglary Resisting Glazing Material; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 10 by 10 inch in size of glass units, showing coloration and design.
- E. Certificate: Certify that sealed insulated glazing units meet or exceed specified requirements.
 - 1. Submit NFRC 100- CMA Bid Report for the project showing compliance with the project thermal requirements at time of initial submission. Bid report shall be based on NFRC test sizes utilizing project specific glazing.
- F. Installer's Certificate: Certify that glass furnished without identification label is installed in accordance with Construction documents and applicable code.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.7 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- C. Laminated Glass: Provide a ten (10) year manufacturer warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. Guardian Industries Corp: www.sunguardglass.com.
 - 2. Solar Seal Company; www.solarseal.com.
 - 3. Vitro Architectural Glass: www.vitroglazings.com
- B. Laminated Glass Manufacturers:
 - 1. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
 - 2. Oldcastle Building Envelope: www.obe.com.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: In accordance with ASCE 7.
 - a. Positive Design Pressure: 20 psf.
 - b. Negative Design Pressure: 20 psf.
 - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
 - 4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 5. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 - 1. In conjunction with weather barrier related materials described in other sections, as follows:
 - 2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.
 - 3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.

2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

2.3 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
 1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
 2. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
 3. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
 4. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
 5. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.
- B. Laminated Glass: Heat-Strengthened float glass laminated in accordance with ASTM C1172.
 1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
- C. Laminated Glass which is also specified as Security Glass shall comply with UL 972 and ASTM F1233, Class 1.3.
 1. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum, or as required to meet specified standards.

2.4 INSULATING GLASS UNITS

- A. Manufacturers:
 1. Glass: Any of the manufacturers specified for float glass.
- B. Insulating Glass Units: Types as indicated.
 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Metal-Edge Spacers: Aluminum, bent and soldered corners.
 3. Spacer Color: Black.
 4. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 - b. Color: Black.
 5. Purge interpane space with dry air, hermetically sealed.
- C. Type IG - Insulating Glass Units: Vision glass, double glazed.
 1. Applications: Exterior safety glazing in exterior doors and sidelites.
 2. Space between lites filled with argon.
 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Solarban 70 Low-E film, on #3 surface.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
 7. Visible Light Transmittance (VLT): 60 percent, nominal.
 8. Solar Heat Gain Coefficient (SHGC): 0.38 percent, nominal.
 9. Glazing Method: Dry glazing method, tape and gasket spline.
- D. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
 1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with argon.

3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Solarban 70 Low-E film, on #3 surface.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Transmittance (VLT): 60 percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.38 percent, nominal.
9. Glazing Method: Dry glazing method, tape and gasket spline.

E.

- F. Type IG-2 - Insulating Glass Units: Translucent glazing.
1. Applications: Exterior glazing as indicated on drawings.
 2. Space between lites filled with honeycomb core filled with Aerogel and non-woven veils bonded to internal glass surfaces.
 3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Self-cleaning type, on #1 surface.
 4. Metal edge spacer.
 5. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 6. Total Thickness: 1.03 inch.
 7. Thermal Transmittance (U-Value): 0.2, nominal.
 8. Visible Light Transmittance (VLT): 45 percent, nominal.
 9. Shading Coefficient: 0.50, nominal.
 10. Solar Heat Gain Coefficient (SHGC): 42 percent, nominal.
 11. Product:
 - a. Advanced Glazings; Solera S R5 + Aerogel: www.advancedglazings.com.
 - b. Or Approved Equal.

2.5 GLAZING UNITS

- A. Type G-1 - Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
 - a. Glazed lites in doors, except fire doors.
 - b. Glazed sidelights to doors, except in fire-rated walls and partitions.
 - c. Glazed view windows and panels in partitions enclosing athletic activity rooms, except in fire-rated walls and partitions.
 - d. Other locations required by applicable federal, state, and local codes and regulations.
 - e. Other locations indicated on drawings.
 2. Glass Type: Fully tempered safety glass as specified.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.
 5. Glazing Method: Dry glazing method, gasket glazing.

2.6 ACCESSORIES

- A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color to match frame.

PART 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- C. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.3 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- C. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- D. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- E. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

3.4 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.5 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- F. Carefully trim protruding tape with knife.

3.6 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Monitor and report installation procedures and unacceptable conditions.

3.7 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.8 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 80 00

SECTION 08 81 00
FIRE RATED GLASS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire rated and safety rated glass for installation in steel frames and vision panels for fire rated doors.
- B. Fire-rated/temperature-rise glass and framing system.

1.2 RELATED SECTIONS:

- A. Section 07 92 00 - Joint Sealants: Sealant and back-up materials.
- B. Section 08 14 16 - Flush Wood Doors: Glazed lites in fire rated doors.
- C. Section 08 71 00 – Door Hardware.
- D. Section 08 80 00 - Glazing.

1.3 REFERENCES

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials used in Buildings - Safety Glazing Specifications and Methods of Test.
- B. ASTM E119 - Standard Test Method for Fire Tests of Building Construction and Materials.
- C. GANA - FGMA Sealant Manual.
- D. GANA - Glazing Manual.
- E. GANA PCR for Flat Glass: UN CPC 3711 Product Category Rule for Environmental Product Declarations.
- F. NFPA 80 - Standard for Fire Doors, Fire Windows.
- G. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- H. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies.
- I. UL 9 - Fire Tests of Window Assemblies
- J. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- K. UL 10B – Fire Tests of Window Assemblies.
- L. UL 263 - Fire Resistance Ratings
- M. CPSC 16 CFR, Part 1201 - Consumer Product Safety Standard - Safety Standard for Architectural Glazing.

1.4 SUBMITTALS

- A. Section 01 30 00 - Administrative Requirements, for Submittal procedures.
- B. Shop Drawings: Show dimensioned plans, elevations and details for doors, frames, and hardware components as shown on drawings and schedules. Provide templates for the location of embeds and anchor locations required any adjoining work.

- C. Product Data: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.
- D. Samples:
 - 1. Provide 12-inch square samples for each type glass specified.
 - 2. Provide manufacturer's color charts showing full range of powder coating colors for framing.
- E. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- F. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.
- G. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.
- H. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum ten years of documented experience.
- B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- D. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252, ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.
- E. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to ASTM E119 and NFPA 257.
 - 1. Window assemblies with ratings of less than 60 minutes may be tested in accordance with NFPA 257, UL 9, CAN4-S106 Standard Test Methods.
- F. Certification: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 - 1. Door assemblies shall be tested to the acceptance criteria of ASTM E2074-00, NFPA 252, UL 9, UL 10-C Standard Methods of Fire Tests of Door Assemblies.
 - 2. Window assemblies shall be tested to the acceptance criteria of NFPA 257, UL 10-B, UL 10-C Standard methods for Fire Tests of Window Assemblies.
 - 3. Wall assemblies shall be tested to the acceptance criteria of ASTM E119, UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 4. An approved independent testing laboratory equal to UL shall conduct fire test

- G. Listings and Labels -Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.
- H. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire protective assemblies.
- I. Door assemblies shall be marked with the hourly rating followed by the letter "S". The letter "S" indicates air leakage resistance testing conformance to UBC 7-2 Parts I and II.
- J. Regulatory Requirements: Comply with provisions of the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1 as follows:
 - 2. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - 3. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 4. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

1.6 PRE-INSTALLATION MEETING

- A. Section 01 30 00 - Administrative Requirements: Preinstallation meeting.
- B. Convene minimum one week before starting Work of this section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer. For details on storage and product handling, please contact Manufacturer and request information on storage and product handling.
- B. Deliver materials to specified destination in manufacturer or distributor's packaging undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.
- D. Do not expose fire rated glass to temperatures greater than 120 degrees or less than minimum 40 Degrees F during storage and transportation.
- E. Do not expose the non-PVB side of glass to UV light.
- F. Store sheets of glass vertically. DO NOT lean.

1.8 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Provide the Manufacturer's limited five year warranty from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 FIRE RATED GLASS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following manufacturers:
 - 1. Safti First; www.safti.com.

2. Substitutions: Section 01 60 00 - Product Requirements.

B. Fire Rated Glazing Type FRG -2:

1. Basis of Design: SAFTIFIRST, a division of O'Keefe's Inc; SuperClear 45-HS-LI
2. Glass Type: 45-minute fire protective glass, specialty fire protective, with hose stream
3. Properties:
 - a. Fire Rating Testing: Fire rating tested and listed by Underwriters Laboratories; tested in accordance with NFPA 252, UL 9, UL 10C, NFPA 252, and ASTM E 2074
 - 1) Fire Rating: 45 minutes with hose stream test for doors, sidelites, transoms, windows.
 - b. Thickness: 3/4 inch (19mm).
 - c. Weight: 9.0 lbs/sf.
 - d. Approximate Visible Light Transmission: 90 percent.
 - e. Impact Safety Performance: ANSI Z97.1 and CPSC 16CFR1201 (CAT I & II).
4. Labeling: Each piece of fire-rated glazing shall be permanently labeled with the Manufacturer's, Warnock Hersey, and/or, Underwriters Laboratories' Logos on sizes up to 3325 sq. inches. Label is also to include name of product, fire rating period, safety glazing standards, and date of manufacture.
5. Framing System: Standard fire rated doors and frames as specified.

2.2 FIRE RATED FRAMING SYSTEM

A. System Includes Fire Rated Glass and Framing System:

1. Glass Product: PYROSTOP; clear, fire and safety rated glazing.
2. Frame Product: FIREFRAMES; Fire Rated Steel Door & Framing System. Frame profiles supplied and distributed by TGP.

B. Performance Options/Requirements:

1. Fire Rating: 60-120-minutes as indicated on drawings.
2. Certification: System tested in accordance with ASTM E-119, UL 263. Temperature on the non-fire side of the system at the conclusion of fire test shall not be more than 250 degree F above the initial ambient room temperature.
3. Listing / Label: Fire Testing shall be conducted by an approved independent test laboratory similar to Underwriters Laboratories, Inc. (UL).

C. Materials:

1. Steel Frame: Profiled steel tubing permanently joined with steel bolts.
2. Insulation: Insulate framing system against effects of fire, smoke, and heat transfer from either side. Insulate profiled steel tubing using a shell construction that incorporates PROMATECT intermediate interlayer. Firmly pack perimeter of framing system to rough opening with mineral wool fire stop insulation or appropriately rated intumescent sealant.
3. Steel Glazing Beads: rolled steel beads with dimensions recommended by manufacturer to securely hold glazing material in place.
4. Fasteners: Type recommended by manufacturer.
5. Glazing Accessories: Set PYROSTOP glass using calcium silicate or neoprene setting blocks.
6. Finish: Powder coated, color as selected by Architect.

2.3 ACCESSORIES

- A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.
- B. Glazing Compound: DAP 33 putty.

- C. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
 - 1. Dow Corning 795 - Dow Corning Corp.
 - 2. Silglaze-II 2800 - General Electric Co.
 - 3. Spectrem 2 - Tremco Inc.
- D. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.4 FABRICATION

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirement.
- B. Fabrication Dimensions: Fabricate fire rated assembly to approved dimensions. Guarantee dimensions where practicable within required tolerance.
- C. Framing System: Furnish frame assemblies pre-welded.
 - 1. Field splice frames too large for shop fabrication or shipping or to fit in available building openings.
 - 2. Fit with manufacturer approved fasteners.
 - 3. Knock-down door perimeter frames are not permitted.
- D. Fabrication Dimensions: Fabricate fire rated assembly to dimensions verified in field.
- E. Obtain approved Shop Drawings prior to fabrication.

2.5 FINISHES

- A. Comply with NAAMM's (National Association of Architectural Metal Manufacturers) "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish frames after assembly.
- C. Protect finishes on exposed surfaces from damage by applying a removable, temporary protective cladding before shipping.
- D. Appearance of Finished Work: Variations in appearance of adjacent frame sections are acceptable. Noticeable variations in the same piece are not acceptable.
- E. Color-Coated Finish: Apply manufacturer's standard powder coating finish system complying with AAMA 2603 applied to factory-assembled frames before shipping, complying with manufacturer's written instructions for surface preparation including pretreatment, application, and minimum dry film thickness.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

- B. Verify openings for glazing are correctly sized and within acceptable tolerance.
- C. Examine glass framing, with glazier present, for compliance with the following.
 - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
 - 2. Minimum required face or edge clearances.
 - 3. Observable edge damage or face imperfections.
- D. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- E. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealant in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. Perform installation in accordance with GANA Glazing Manual.
 - 1. Glazing Sealants: Comply with FGMA and ASTM C1193.
 - 2. Fire Rated Openings: Comply with NFPA 80.
- B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.
- D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.
- F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- G. Place glazing tape on free perimeter of glazing in same manner described above.
- H. Install removable stop and secure without displacement of tape.
- I. Install in vision panels in fire-rated doors to requirements of NFPA 80.
- J. Install so that appropriate UL markings remain permanently visible.

3.4 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove non-permanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
 - 2. Bullet resistant glazing materials with sensitive protect surface applied film on exterior surface. Do not use any of the following:
 - a. Steam jets.

- b. Abrasives.
 - c. Strong acidic or alkaline detergents, or surface-reactive agents.
 - d. Detergents not recommended by manufacturer.
 - e. Detergent above 77 degrees F (25 degrees C).
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.5 REPAIR AND TOUCH UP

- A. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
- 1. Such repairs shall match original finish for quality or material and view.
 - 2. Repairs and touch-up not visible from a distance of 5 feet (1.5 m). Owner and Architect to approve.
- B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged

END OF SECTION 08 81 00

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Resilient tile and sheet.
 - 2. Carpet tile.
 - 3. Thin-set ceramic tile and stone tile.
 - 4. Resinous Matrix Terrazzo.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall include, in base bid, specified remediation work of all interior concrete floor slabs receiving floor coverings outlined below. If such remediation is indicated as not necessary following testing agency's report, a contract modification will be issued.
 - 2. Remedial Floor Coating to include in base bid at:
 - a. Existing concrete slabs receiving adhesively applied flooring.
 - b. Existing concrete slabs receiving Resinous Matrix Terrazzo.
 - c. New concrete slabs receiving Resinous Matrix Terrazzo.
 - d. Existing concrete slabs receiving Wood athletic flooring.
 - 3. Remedial Floor Coating not included in base bid at:
 - a. New concrete slabs receiving adhesively applied flooring where Moisture Vapor Reduction Admixture (MVRA) is integral in the new slab.
 - b. Existing concrete slabs receiving thin-set applied flooring, including but not limited to ceramic, quarry, and stone tile.
 - c. New concrete slabs receiving thin-set applied flooring, including but not limited to ceramic, quarry, and stone tile.
- F. Patching compound.
- G. Remedial floor coatings.

1.2 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.
- C. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.
- D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.
- E. Section 03 54 00 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.3 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.
- C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a.
- D. ASTM F3010 - Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings; 2018.
- E. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2022.
- G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- H. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2011.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Visual Observation Report: For existing floor coverings to be removed.
- C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 - 1. Moisture and alkalinity (pH) limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.
- D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
 - 1. Manufacturer's qualification statement.
 - 2. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
 - 3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
 - 4. Manufacturer's installation instructions.
 - 5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- E. Testing Agency's Report:
 - 1. Description of areas tested; include marked up floor finish plans and photographs if helpful.
 - 2. Summary of conditions encountered.
 - 3. Moisture and alkalinity (pH) test reports.
 - 4. Copies of specified test methods.
 - 5. Recommendations for remediation of unsatisfactory surfaces.
 - 6. Product data for recommended remedial coating.

- 7. Submit report to Architect.
- 8. Submit report not more than two business days after conclusion of testing.
- F. Adhesive Bond and Compatibility Test Report.
- G. Copy of RFCI (RWP).

1.6 PERFORMANCE REQUIREMENTS

- A. Manufacturer must provide Independent lab test reports documenting performance per the following:
 - 1. ASTM E 96, Water Vapor Transmission (wet method) Performance shall be documented by an independent testing laboratory at a minimum of 97% water vapor transmission reduction compared to untreated concrete.
 - 2. ASTM E96- Perm Rating - Standard Test Method for Water Vapor Transmission of Materials – Perm Rate results must not exceed 0.1 Perms.
 - 3. ASTM D 1308; Insensitivity to alkaline environment up to, and including, pH 14. A 14 day test is required with no degradation of sample reported.
 - 4. Certify acceptance and exposure to continuous topical water exposure after final cure.

1.7 QUALITY ASSURANCE

- A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
 - 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
 - 1. Provide access for and cooperate with testing agency.
 - 2. Confirm date of start of testing at least 10 days prior to actual start.
 - 3. Allow at least 4 business days on site for testing agency activities.
 - 4. Achieve and maintain specified ambient conditions.
 - 5. Notify Architect when specified ambient conditions have been achieved and when testing will start.
- D. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

1.9 FIELD CONDITIONS

- A. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use, maintained 48 hours prior to and during testing. If this is not possible, use the following guidelines:
- B. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

- C. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
 - 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 - 2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
 - 3. Products:
 - a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
 - b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
 - c. CMP Specialty Products; Prepstar: www.cmpsp.com.
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single-layer epoxy based coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
 - 1. System shall comply with requirements of ASTM F3010.
 - 2. Thickness: As required for application and in accordance with manufacturer's installation instructions.
 - 3. Water Vapor reduction system shall be a single coat, stand alone system with no requirements for additional components such as sand broadcast for adhesion of flooring systems.
 - 4. System must reduce Calcium Chloride readings of up to 25lbs/1000 ft²/24 hrs by 97% in one coat. System must be able to perform as required with RH Probe readings of 100%.
 - 5. Products:
 - a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
 - b. CMP Specialty Products; Lockdown: www.cmpsp.com.
 - c. Koster American Corporation; VAP I 2000: www.kosterusa.com/#sle.
 - d. Or as approved by manufacturer of flooring system.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:

1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
 - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
 - b. Removal of existing floor covering.
 2. Preliminary cleaning.
 3. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 4. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 5. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 6. Specified remediation, if required.
 7. Patching, smoothing, and leveling, as required.
 8. Other preparation specified.
 9. Adhesive bond and compatibility test.
 10. Protection.
- B. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 2. Excessive Moisture Emission or Relative Humidity: Apply remedial floor coating over entire suspect floor area.
 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.2 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.3 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.4 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.5 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.6 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
 - 3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
- C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.7 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Comply with recommendations for preparation and application in accordance with ASTM F3010.
- D. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a Concrete Surface Profile (CSP) #3 or #4 and clean surfaces with an industrial vacuum cleaner and remove all residues from the substrate. Grinding is allowed only in areas not accessible by shot blasting. Remove ALL defective materials, and foreign matter such as dust, adhesives, leveling compounds, paint, dirt, floor hardeners, bond breakers, oil, grease, curing agents,

form release agents, efflorescence, laitance, Shot blast bee bees, etc. Repair all cracks, expansion joints, control joints, and open surface honeycombs and fill in accordance with Manufacturer's recommendations. If concrete additives such as chlorides or any other soluble compounds that may contaminate surfaces have been used in the concrete mix do not use this product on that floor without written approval from manufacturer. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. Provide an uncontaminated, sound surface. DO NOT ACID ETCH!

- E. Repair concrete prior to moisture vapor reduction system installation by using MVRS manufacturer's approved concrete repair materials. Comply with all requirements as listed in Manufacturer's technical data information. Consult with vapor reduction manufacturer.
- F. Ensure surfaces to be treated with moisture vapor reduction system have NOT previously been treated with other materials such as underlayments, screeds, penetrating sealants, silicates, etc. If this is the case, consult with the Manufacturer's Representative prior to any application of moisture vapor reduction system.
- G. Any testing for concrete deficiencies or contamination such as alkali silica reaction, untreated silicates, organic residue, etc. is recommended and is the responsibility of the Building owner.
- H. Shot blast a small test area and review surface profile with the finished flooring applicator.
- I. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- J. Do not fill expansion joints, isolation joints, or other moving joints.

3.8 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. The Owner's Special Inspector shall verify proper adhesion of flooring adhesives, coatings, and leveling compounds to the final vapor reduction coating system for acceptability. Contact Manufacturer's Representatives for recommendations.
- B. Comply with requirements and recommendations of floor covering manufacturer.

3.9 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.
- B. Allow to cure a minimum of 12 hours before installing flooring system.

3.10 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.
- B. Protect each coat during specified cure period from any kind of traffic, topical water and contaminants.

END OF SECTION 09 05 61

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Acoustic insulation.
- D. Cementitious backing board.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- B. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.

1.3 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
- E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- G. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- H. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
- I. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- J. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).
- K. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

- L. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- M. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- N. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.
- O. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- P. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- Q. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- R. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- S. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
- T. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.
- U. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018.
- V. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022.
- W. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- X. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).
- Y. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- Z. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- AA. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- AB. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- AC. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.
- AD. GA-224 - Installation of Predecorated Gypsum Board; Gypsum Association; 2008.
- AE. GA-226 - Application of Gypsum Board to Form Curved Surfaces; 2019.
- AF. GA-600 - Fire Resistance and Sound Control Design Manual; 2021.
- AG. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- C. Samples: Submit two samples of predecorated gypsum board, 12 by 12 inches in size, indicating finish color and texture.
- D. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least ten years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- C. Store metal products to prevent corrosion.

1.8 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire Rated Assemblies: Provide completed assemblies (Tested rating determined in accordance with ASTM119) with rating as indicated on drawings.
 - 1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.2 METAL FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
- B. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 2. Marino: www.marinoware.com/#sle.
 - 3. MBA Studs: www.mbastuds.com
- C. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Studs: C-shaped with knurled or embossed faces.
 - 2. Minimum Base Metal Thickness: 18 mils; 0.018 inch, or as required to meet design or code requirements.
 - 3. Runners: U shaped, sized to match studs.
 - 4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
- D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
 - 3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
 - 4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
 - a. Products:
 - 1) ClarkDietrich; MaxTrak Slotted Deflection Track: www.clarkdietrich.com/#sle.
 - 2) Marino; Slotted Track: www.marinoware.com/#sle.
 - 3) MBA Building Supplies; Slotted Slip Track: www.mbastuds.com/#sle.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.

2.3 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. CertainTeed Corporation: www.certainteed.com/#sle.
 - 2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 - 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 4. USG Corporation: www.usg.com/#sle.
- A. Gypsum Wallboard - General
 - 1. All gypsum wallboard incorporated into the Work, whether indicated or not, shall comply with all of the following:
 - a. Thickness: 5/8 inch.
 - b. Core: Type X, UL or WH listed.
 - 1) Exception: Where Fire Resistance Rating requires Type C.
 - c. Core and Face: Moisture and mold resistant, with a mold resistance score of 10, when tested in accordance with ASTM D3273.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold resistant board is required at all locations.
 4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 5. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
 6. Mold-Resistant, Paper-Faced Products:
 - a. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
 - b. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
 - c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Gypsum Board: www.goldbondbuilding.com/#sle.
 - d. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
 7. Glass Mat Faced Products:
 - a. Georgia-Pacific Gypsum; DensArmor Plus: www.gpgypsum.com/#sle.
 - b. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Interior Extreme Fire-Shield Gypsum Panel: www.goldbondbuilding.com/#sle.
 - c. USG Corporation; Sheetrock Brand Glass-Mat Panels Mold Tough Regular 1/2 in. (12.7 mm): www.usg.com/#sle.
- C. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 5/8 inch.
 - b. Products:
 - 1) PermaBASE Building Products, LLC provided by National Gypsum Company; PermaBase Cement Board: www.goldbondbuilding.com/#sle.
 4. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
 - a. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.
 - b. Products:
 - 1) CertainTeed Corporation; 5/8" GlasRoc Tile Backer Type X: www.certainteed.com/#sle.
 - 2) Georgia-Pacific Gypsum; DensShield Tile Backer: www.gpgypsum.com/#sle.
 - 3) Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Fire-Shield Tile Backer: www.goldbondbuilding.com/#sle.
 - 4) USG Corporation; Durock Brand Glass-Mat Tile Backerboard 5/8 in. (15.9 mm): www.usg.com/#sle.
 - 5) Substitutions: See Section 01 60 00 - Product Requirements.

2.4 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: To match wall depth.

- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- C. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rolled zinc, unless noted otherwise.
 - 1. Types: As detailed or required for finished appearance.
 - 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
 - 3. Products:
 - a. Same manufacturer as framing materials.
- D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 - 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
 - 4. Joint Compound: Setting type, field-mixed.
- E. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
 - 1. Products:
 - a. CertainTeed Corporation; Level V Wall and Ceiling Primer/Surfer with M2Tech: www.certainteed.com/#sle.
 - b. USG Corporation; USG Sheetrock Brand Tuff-Hide Primer-Surfer: www.usg.com/#sle.
- F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.
- H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that project conditions are ready to receive work and opening dimensions are as indicated on shop drawings to commence.

3.2 EXISTING WORK

- A. Extend existing gypsum board installations using materials and methods as specified.
- B. Repair and remodel existing gypsum board assemblies which remain or are to be altered.

3.3 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C1007/AISI S220 and manufacturer's instructions.

- B. Studs: Space studs at 16 inches on center.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging. Provide extended leg ceiling runners with compressible fire rated fill.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- D. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
- E. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- F. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.
- G. Blocking: Install wood blocking for support of:
 - 1. Wall-mounted cabinets.
 - 2. Plumbing fixtures.
 - 3. Toilet partitions.
 - 4. Toilet accessories.
 - 5. Wall-mounted door hardware.
 - 6. Wood frame opening.
 - 7. Or any other materials requiring blocking. Coordinate blocking requirements with other contractors.

3.4 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Place two beads continuously on substrate before installation of perimeter framing members.
 - 2. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, rough-in boxes, and other equipment. Do Not seal penetrations scheduled to receive firestopping.

3.5 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
 - 1. Use screws when fastening gypsum board to metal furring or framing.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer Non-Rated:
 - 1. Use gypsum backing board for first layer, placed perpendicular to framing or furring members, with ends and edges occurring over firm bearing. [Use fire rated gypsum backing board for fire rated partitions and ceilings.]
 - 2. Place second layer parallel to framing or furring members.
 - 3. Offset joints of second layer from joints of first layer.
 - 4. Treat cut edges and holes in moisture resistant gypsum board with sealant.

- D. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
 - 1. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- F. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
 - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- G. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
- H. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- I. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.6 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart for exposed interior linear construction.
 - 2. Not more than 25 feet where ceramic wall tile is installed on an interior wall.
 - 3. Not more than 12 feet where ceramic wall tile is installed on an exterior wall, in direct sunlight or wet conditions.
 - 4. At metal door frames and windows above each jamb.
 - 5. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.7 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 3: Walls to receive textured wall finish.
 - 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 6. Level 0: Temporary partitions.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.8 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09 21 16

SECTION 09 30 00
TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Ceramic trim.
- E. Non-ceramic trim.
- F. Waterproofing membrane.
- G. Crack isolation membrane.
- H. Setting materials, grouts, maintenance materials, & accessory materials.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- C. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.3 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.
 - 1. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017.
 - 2. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.
 - 3. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2021).
 - 4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2019.
 - 5. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2021.
 - 6. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 1999 (Reaffirmed 2019).
 - 7. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2019).
 - 8. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2019).

9. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017.
10. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
11. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).
12. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).
13. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.
14. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.
15. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
16. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2019.
17. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
18. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
19. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2014 (Reaffirmed 2019).
20. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).
21. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2019.
- B. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- C. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials; 2021.
- D. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
- E. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018.
- F. ASTM C666/C666M - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing; 2015.
- G. ASTM D4551 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane; 2022.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a.
- I. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023.
- J. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples: Submit two sets of samples of the following for color selection or verification of color and finish variations:
 - 1. Tile products.
 - 2. Threshold, trims, and accessories.
 - 3. Grouts.
 - 4. Sealants.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.
- G. Installer's Qualification Statement:
 - 1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation; www.tile-assn.com/#sle
 - 2. Submit documentation of completion of apprenticeship and certification programs.
- H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than 2 of each type.

1.6 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for closeout procedures.

1.7 QUALITY ASSURANCE

- A. Maintain one copy of ANSI A108/A118/A136, TCNA (HB), and TCNA (HB-GP) on-site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum ten years of documented experience.
- C. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.
 - a. Accredited Five-Star member of the National Tile Contractors Association (NTCA) or Trowel of Excellence member of the Tile Contractors' Association of America (TCAA).

2. Installer Certification:
 - a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).
 - b. Apprenticeship Program: Installer has achieved Journeyworker status through an apprenticeship from the International Union of Bricklayers and Allied Craftworkers (IUBAC) or a U.S. Department of Labor (DOL)-recognized program.
 - c. Advanced Certifications for Tile Installers (ACT): Certification in the installation of membranes, mortar bed (mud) floors, mortar (mud) walls, shower receptors, large format tile, gauged porcelain tile/panels/slabs, and grouts.
 - d. International Masonry Training and Education Foundation (IMTEF): Supervisor Certification Program (SCP).
- D. Warranty: Installer of work contained in this Section to warrant installation for minimum of 1 year from date of completion for defects in workmanship.

1.8 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for general requirements for mock-up.
- B. Construct tile mock-up where directed by Architect, incorporating all components specified for the location.
 1. Minimum size of mock-up shall be determined by Architect.
 2. Approved mock-up may remain as part of work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.
- B. See Section 01 60 00 - Product Requirements for product storage and handling requirements.
- C. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.10 FIELD CONDITIONS

- A. Do not install adhesives and grouts in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.
- C. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 TILE

- A. Manufacturers:
 1. Crossville, Inc.: www.crosvilleinc.com
 2. Dal-Tile Corporation: www.daltile.com/#sle.
 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Keystones Porcelain Mosaic Tile, Type FT-1,3,4,5: ANSI A137.1, standard grade.
 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 2" by 2" inch, nominal.
 3. Shape: Square.
 4. Edges: Cushioned.
 5. Surface Finish: Unglazed.
 6. Color(s): Refer to Finish Key.

- a. FT-1: Daltile Keystones Mosaic Blend: DK-21 Wheat Blend, Application: Toilet Rooms.
 - b. FT-3: Daltile Keystones: D617 Arctic White, Application: General Pool Deck.
 - c. FT-4: Daltile Keystones: D182: Suede Grey, Application: General Pool Deck.
 - d. FT-5: Daltile Keystones Mosaic Blend: Custom Blend 66% Arctic White, 17% Luminary Gold, 17% Castlerock. Application: Pool Deck Border.
- 7. Products:
 - a. Dal-Tile Corporation; Keystones: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Keystones Porcelain Mosaic Tile, Type FT-6,7,8: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
 - 2. Size: 1" by 1" inch, nominal.
 - 3. Edges: Cushioned.
 - 4. Color(s): Refer to Finish Key.
 - a. FT-6: Daltile Keystones: D617 Arctic White, Application: Pool Border General, Ramp.
 - b. FT-7: Daltile Keystones: D618 Castlerock, Application: Pool Border Accent, Ramp.
 - c. FT-8: Daltile Keystones: D311 Black, Application: Pool Depth Markers.
 - 5. Pattern: As indicated on drawings.
 - 6. Basis of Design Products:
 - a. Dal-Tile Corporation; Keystones: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Porcelain Floor Tile, Type FT-2: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 8" by 8" inch, nominal.
 - 3. Thickness: 0.41 inch.
 - 4. Edges: Square.
 - 5. Color(s): As indicated on drawings.
 - 6. Trim Units: Matching Cove shapes in sizes indicated:
 - a. Color: CB-1: Ashen Gray 0T03.
 - b. Size: 5 x 6 inch, nominal.
 - 7. Products:
 - a. Dal-Tile Corporation; Quarry Textures: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Porcelain Wall Tile, Type WT-1: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 6" by 24" inch, nominal.
 - 3. Thickness: 5/16 inch.
 - 4. Edges: Cushioned.
 - 5. Surface Finish: Polished.
 - 6. Color(s): As indicated on drawings.
 - 7. Trim Units: Matching bullnose and straight trim shapes in sizes indicated:
 - a. Color: CT-2: RET04-UPS Empress White.
 - b. Size: 4 x 12 inch, nominal.
 - 8. Products:
 - a. Crossville Inc.; RetroActive 2.0: www.crossvilleinc.com..
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Porcelain Wall Tile, Type WT-2,6,7: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 6" by 36" inch, nominal.
 - 3. Thickness: 0.41 inch.
 - 4. Edges: Square.
 - 5. Surface Finish: UPS.
 - 6. Color(s): Refer to Finish Key.

7. Trim Units: Matching Bullnose shape in sizes indicated:
 - a. Color: CT-1: Peaceful Olive AV365.
 - b. Color: CB-2: Blissful Olive AV363
 - c. Size: CT-1: 6 x 18 inch, nominal.
 - d. Size: CB-2: 6 x 12 inch, nominal.
 8. Products:
 - a. Crossville Inc.; Nest Series: www.crossvilleinc.com..
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Porcelain Wall Tile, Type WT-3: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 8" by 12" inch, nominal.
 3. Thickness: 5/16 inch.
 4. Edges: Cushioned.
 5. Color(s): Refer to Finish Key.
 6. Products:
 - a. Dal-Tile Corporation; Harmonist: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Porcelain Wall Tile, Type WT-4: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 4" by 12" inch, nominal.
 3. Thickness: 3/8 inch.
 4. Edges: Cushioned.
 5. Surface Finish: UPS.
 6. Color: Refer to Finish Key.
 7. Trim Units: Matching cove and straight base shapes in sizes indicated on finish key, CB-3,4.
 8. Products:
 - a. Crossville Inc.; Main Street; Get Planked Series: www.crossvilleinc.com..
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Porcelain Wall Tile, Type WT-8,9: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 3" by 15" inch, nominal.
 3. Thickness: 3/8 inch.
 4. Edges: Square.
 5. Surface Finish: UPS.
 6. Color: As indicated on Finish Key.
 7. Products:
 - a. Crossville Inc.; Nest Series: www.crossvilleinc.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- J. Glazed Ceramic Wall Tile, Type WT-5: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 3" by 6" inch, nominal.
 3. Thickness: 3/8 inch.
 4. Edges: Cushioned.
 5. Surface Finish: Gloss.
 6. Color: Refer to Finish Key.
 7. Products:
 - a. Florida Tile: Emotive. <https://www.floridatile.com/>.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching bullnose and cove base shapes in sizes coordinated with field tile or as indicated on finish key.
 - 1. Applications:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Jointed.
 - c. Floor to Wall Joints: Cove base.
 - 2. Manufacturers: Same as for tile.
- B. Non-Ceramic Trim: Brushed stainless steel and Polished stainless steel 316, style and dimensions as indicated on drawings, for setting using tile mortar or adhesive.
 - 1. Thickness: As required by installation and to comply with ADA Regulations.
 - 2. Applications:
 - a. Open edges of wall and floor tile.
 - b. Outside wall corners.
 - c. Transition between floor finishes of different heights.
 - d. Thresholds at door openings.
 - e. Floor and wall expansion and control joints.
 - f. Borders and other trim as indicated on drawings.
 - g. Use stainless steel 316 for all pool transition applications.
 - 3. Products:
 - a. LATICRETE International, Inc; Profiles and Trims: www.laticrete.com/#sle.
 - b. Profilitec; Profiles: www.us.profilitec.com.
 - c. Schluter-Systems; Profiles: www.schluter.com/#sle.

2.3 SETTING MATERIALS

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
 - 1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2. Bostik Inc: www.bostik-us.com/#sle.
 - 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 - 4. LATICRETE International, Inc: www.laticrete.com/#sle.
- C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
 - 1. Applications: Use this type of bond coat where indicated, and where no other type of bond coat is indicated; and for submerged applications.
 - 2. Products:
 - a. LATICRETE International, Inc; 253 Platinum: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
 - 1. Applications: Use this type of bond coat where Large and Heavy Tile (LHT) mortar is indicated, for tile that exceeds 15" in any one dimension.
 - 2. Products:
 - a. LATICRETE International, Inc; MULTIMAX LITE: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
 - 1. Applications: Where required to repair mud bed inside pool & deck locations where required for sloping to trench drain.
 - 2. Products:
 - a. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 GROUTS

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
 - 1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2. Bostik Inc: www.bostik-us.com.
 - 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 - 4. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- C. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
 - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 3. Products:
 - a. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 - 1. Applications: Where indicated, refer to Finish Key.
 - 2. Color(s): As scheduled. Refer to Finish Key
 - 3. Products:
 - a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Premixed Polymer Modified Grout: ANSI A118.3. Single component, stain resistant grout.
 - 1. Applications: Where indicated, refer to Finish Key.
 - 2. Color(s): As indicated on drawings.
 - 3. Products:
 - a. LATICRETE International, Inc; SPECTRALOCK 1 Pre-Mixed Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
 - 1. Applications: Between tile and plumbing fixtures.
 - 2. Color(s): As selected by Architect.
 - 3. Products:
 - a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Epoxy Grout Haze Remover: Water based gel for vertical and horizontal surfaces.
 - 1. Products:
 - a. STONETECH, a division of LATICRETE international, Inc; STONETECH Epoxy Grout Haze and Coating Stripper: www.laticrete.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 ACCESSORY MATERIALS

- A. Cementitious waterproofing membrane to be a one component, polymer-fortified cement-based waterproofing material for Under Cementitious Mortar in Swimming Pool: Slurry

coating of Portland or hydraulic cement, aggregates, polymer admixtures, and water; no solvents; for application directly to cementitious substrate, with recoat time of less than 24 hours.

1. Explicitly recommended by manufacturer as waterproofing, not simply as dampproofing.
 2. Provide finished product capable of bridging cracks up to 0.04 inch in width without failure.
 3. Water Vapor Transmission: Permeance of finished coating of 3.9-4 perm, minimum, when tested in accordance with ASTM E96/E96M.
 4. Freeze-Thaw Durability: No change when tested in accordance with ASTM C666/C666M for 300 cycles.
 5. Compressive Strength: 5,000 psi, minimum, at 28 days, when tested in accordance with ASTM C109/C109M.
 6. Finished Coating Thickness: As recommended by manufacturer for the specific application but not less than 40 mils.
 7. Product:
 - a. Laticrete International, Inc; Hydro Ban Cementitious Waterproofing Membrane: www.laticrete.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Waterproofing and Slab Crack Isolation Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Crack Resistance: No failure at 1/8 inch gap, minimum; comply with ANSI A118.12.
 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber.
 - b. Thickness: 25 mils, minimum, dry film thickness.
 - c. Products:
 - 1) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
 - 2) Substitutions: See Section 01 60 00 - Product Requirements.
- C. Backer Board: Cementitious type; See Section 09 21 16 - Gypsum Board Assemblies.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that sub-floor surfaces, in areas with floor drains, are pitched uniformly to drains at 1/4 inch per foot nominal if not indicated on the drawings.
1. Exception: Where tile is installed in areas of previously removed floor covering, and the sub-floor does not meet the stated pitch, build up thinset during installation to provide a positive pitch to drains of 1/8" per foot, minimum in all directions.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.

- E. Install waterproofing membrane according to manufacturer's instructions. Provide Cementitious waterproofing for inside pool to 3 inches beyond locations indicated to receive tile. Coordinate installation with other trades to ensure application meets manufacturer recommended installation guidelines.
- F. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.
- G. Scarify existing glazed structural block prior to installation of wall tile.
- H. Place thresholds and edge strips at exposed tile edges.

3.3 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2" width is used.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
 - 1. Tile joint width shall be as recommended by manufacturer for the individual tile type indicated, however, tile joint shall be no less than 1/8 inch, unless otherwise noted.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Maintain specified positive pitch to all floor drains in all directions.
- H. Install non-ceramic trim in accordance with manufacturer's instructions.
- I. Sound tile after setting. Replace hollow sounding units.
- J. Control and Expansion Joints:
 - 1. Keep control and expansion joints free of mortar, grout, and adhesive.
 - 2. Provide interior control joints in tiled surfaces at 20'-25' in each direction.
 - 3. Provide exterior control joints in tiled surfaces at 8'-12' in each direction.
 - 4. Provide interior control joints in tiled surfaces exposed to direct sunlight or moisture at 8' to 12' in each direction.
 - 5. Provide movement joints where tile work abuts restraining surfaces, including perimeter walls, dissimilar floors, curbs, columns, pipes, door and window frames and where changes occur in backing materials.
 - 6. Joints through tilework directly over structural joints must never be narrower than the structural joint.
 - 7. Apply sealant to joints.
- K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- L. Grout tile joints unless otherwise indicated.
- M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- N. When installation requires varying tile thickness due to patterning, build up thinset so that the entire installation is flush.

- O. Seal all sanded and unsanded grout, with the exception of epoxy grout, per grout manufacturer's installation instructions.

3.4 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout.
 - 1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.
 - 2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F131.

3.5 INSTALLATION - WALL TILE

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms.
- B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.
- C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.6 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Clean tile and grout surfaces per manufacturer's recommendations.

3.7 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Do not permit traffic over finished floor surface for 4 days after installation.
- C. Protect installed tile from damage due to subsequent construction until Date of Substantial Completion.

3.8 SCHEDULE

- A. Refer to Finish Key and Schedules.

END OF SECTION 09 30 00

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.
- F. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2022.
- G. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2022.
- H. CHPS (HPPD) - High Performance Products Database; Current Edition.
- I. CISCA (AC) - Acoustical Ceilings: Use and Practice; 1999.
- J. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, mechanical and electrical items installed in the ceiling, and indicate method of suspension where interference exists. Submit shop drawings for all custom shapes, clouds,

and ceiling formations illustrating understanding of Architect's intent. Notify Architect in writing of any conflicts or dimensional changes.

- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit two samples 6 x 6 inch size illustrating material and finish of acoustical units.
- E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, and perimeter molding.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Manufacturer's qualification statement.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.
 - 3. Extra Exposed Grid: Quantity equal to 2 percent of total installed.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work specified in this section with minimum five years documented experience.
- C. Conform to CISCA (AC) requirements.
- D. Single Source Responsibility: To obtain combined warranty for the suspension system and the acoustical panel, color match or ceiling panel and suspension system compatibility, all acoustical panel and suspension system components shall be produced and supplied by one manufacturer. Materials supplied by more than one manufacturer are not acceptable.
- E. Source quality control:
 - 1. Test reports: Manufacturer will provide test certification for minimum requirements as tested in accordance with applicable industry standards and/or to meet performance standards specified by various agencies.
 - 2. Changes from system: System performance following any substitution of materials or change in assembly design shall be certified by the manufacturer.
 - 3. All ceiling panel cartons must contain UL label for acoustical compliance.
 - 4. All suspension system cartons must contain UL label for load compliance per ASTM C635.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements.
- B. Storage:
 - 1. Panels: Storage time of materials at the job site should be as short as possible and environmental conditions should be as near as possible to those specified for occupancy.
 - 2. Suspension System: Store in manner that will prevent warping, scratches and damage of any kind.
- C. Handling: Handle in such manner to ensure against racking, distortion, or physical damage of any kind.
- D. Damaged or deteriorated materials shall be removed from the premises.

1.8 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.9 WARRANTY

- A. Provide written warranty executed by the manufacturer, agreeing to repair or replace acoustical ceiling products that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 - 2. Grid System: Rusting and manufacturer's defects.
 - 3. Warranty Period:
 - a. Acoustical panels: Ten years from date of substantial completion.
 - b. Grid: Ten years from date of substantial completion.
 - c. Combined single source panel and grid: Thirty years from date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
 - 2. USG: www.usg.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems:
 - 1. Same as for acoustical units.

2.2 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
 - 1. VOC Content: As specified in Section 01 61 16.
 - 2. VOC Content: Certified as Low Emission by one of the following:
 - a. Product listing in UL (GGG).
 - b. Product listing in CHPS (HPPD).
 - 3. Inherently resistant to humidity, sag, mold, and mildew.
- B. Acoustical Panels, Type ACT-1: Mineral fiber with membrane-faced overlay, with the following characteristics:
 - 1. Classification: ASTM E1264 Type A.
 - a. Form: 2, water felted.
 - b. Pattern: "E" - lightly textured.
 - 2. Size: 24 by 24 inches.
 - 3. Thickness: 7/8 inch.
 - 4. Panel Edge: Reveal.
 - 5. Tile Edge: Beveled.
 - 6. Color: White.
 - 7. Suspension System: Exposed grid.
 - 8. Products:
 - a. Armstrong World Industries, Inc; Ultima High NRC:
www.armstrongceilings.com/#sle.

- b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Acoustical Panels, Type ACT-2: Ceramic-bonded mineral fiber, with the following characteristics:
 - 1. Classification: ASTM E1264 Type XX.
 - a. Pattern: "E" - lightly textured.
 - 2. Size: 24 by 24 inches.
 - 3. Thickness: 15/16 inch
 - 4. Light Reflectance: 0.79 percent, determined in accordance with ASTM E1264.
 - 5. NRC Range: 0.5 to 0.55, determined in accordance with ASTM E1264.
 - 6. Panel Edge: Square.
 - 7. Color: White.
 - 8. Suspension System: Exposed grid.
 - 9. Products:
 - a. Armstrong World Industries, Inc; Ceramaguard Fine Fissured
www.armstrongceilings.com/#sle.

2.3 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
 - 1. Materials:
 - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
 - b. Aluminum Grid: Aluminum sheet, ASTM B209/B209M.
 - c. Stainless Steel Grid: ASTM A666, Type 304.

2.4 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
- D. Metal Edge Trim for Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
 - 1. Trim Height: 6 inch.
 - 2. Finish: Baked enamel.
 - 3. Color: White.
 - 4. Products:
 - a. Armstrong World Industries, Inc; Axiom: www.armstrongceilings.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.2 PREPARATION

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.
- C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.3 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M (seismic regulations), and manufacturer's instructions, and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.
- E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Do not eccentrically load system or induce rotation of runners.
- I. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.
- J. Where installing sheet metal trim between two overlapping ceiling planes, provide a StrongBack Support (SB-12) as an attachment point for the lower ceiling plane. Span entire length of connection.

3.4 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. For some pattern edge details, if perimeter panels must be cut smaller, the cut edge must be field-rabbeted, or the wall angle must be lowered by reveal depth.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.

- G. Where round obstructions and bullnose concrete block corners occur, provide preformed closures to match perimeter molding.

3.5 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.6 CLEANING

- A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- B. Clean surfaces.
- C. Replace damaged or abraded components.

3.7 SCHEDULE

- A. Refer to drawings for Finish Key and Schedule

END OF SECTION 09 51 00

SECTION 09 64 30
WOOD FLOOR REFINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site Refinishing of Wood Gymnasium Flooring.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- B. MFMA (PUR) - Performance and Uniformity Rating Sport Specific Standards; current edition.
- C. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements for coordination and preinstallation meeting requirements.
- B. Coordination:
 - 1. Coordinate work of this section with other trades, including but not limited to installers requiring lifts on the existing floor and mechanical work involving air handling equipment.
 - 2. Coordinate work of this section with new floor mounted equipment or anchorage specified in Section 11 66 23 - Gymnasium Equipment.
- C. Preinstallation Meetings: Convene minimum one week prior to commencing work of this section. Include all other affected trades. Review installation procedures including procedures for acclimation of flooring materials.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets for all floor finish materials, including fillers, sealers, paints, and finishes.
- C. Installation instructions including product limitations and special requirements.
- D. Shop Drawings: Provide complete layout indicating court lines, location, design, size and color game markings for approval of Architect and Owner.
 - 1. Incorporate Owner furnished logo(s) into layout.
- E. Samples: Submit two samples of sealers, paint, and finishes illustrating range of colors and sheens available for selection.
- F. Verification Samples: Submit two samples, illustrating selected colors and sheens for each system with specified coats cascaded. Submit on wood substrate of same species being refinished, 6 by 12 inch in size.

- G. Manufacturer's Certification: Submit certification that floor finish materials meet federal and state VOC regulations.
- H. Manufacturer's Qualifications statement.
- I. Installer's Qualifications statement.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, suggested schedule for cleaning, stripping, and re-finishing, stain removal methods, and polishes and waxes.

1.7 QUALITY ASSURANCE

- A. Perform Work of this section in accordance with MFMA (SPEC) and MFMA (PUR)- Maple Flooring Manufacturer's Association.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- C. Installer: Company specializing in performing work of this section with minimum five years documented experience.
 - 1. The Contractor shall be an MFMA Mill Accredited Installation Company with MFMA Accredited Installers on-site for the duration of the refinish.

1.8 EXTRA MATERIALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

1.9 FIELD CONDITIONS

- A. Resurfacing of an existing floor system shall not commence until all masonry, finish and/or wet trades, such as, concrete, painting, tile and overhead mechanical trades are complete. The building must be enclosed and weather tight.
- B. Permanent heat, light and ventilation shall be installed and operating before, during and after the resurfacing is complete.
- C. Do not refinish when temperature is below 50 degrees F or above 90 degrees F.
- D. Maintain ambient and substrate temperature within specified range 24 hours before, during, and 72 hours after installation of finish.
- E. Prior to and during installation, the Contractor shall verify that the dew point is at least 5 degrees Fahrenheit less than the substrate and air temperature.
- F. Provide ambient lighting level of 50 ft candles, measured at floor surface.

1.10 WARRANTY

- A. Provide floor finish and game marking warranty against defects and premature finish failure for two years after substantial completion date.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gymnasium Wood Floors:
 - 1. Bona: www.bona.com.
 - 2. Buckeye International Inc.: www.buckeyeinternational.com.
 - 3. Duraseal: www.duraseal.com.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements for substitution procedures.

2.2 FLOOR FINISH - GENERAL

- A. Finishes:
 - 1. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 2. Provide finishes from the same manufacturer to the greatest extent possible.
 - 3. Supply each finish material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

2.3 FLOOR FINISH SYSTEMS

- A. Gymnasium Wood Floors:
 - 1. Two coat(s) sanding sealer.
 - 2. Minimum one coat paint for game lines and logos. Second coat may be required for some colors and patterns.
 - 3. Three coat(s) finish.

2.4 ACCESSORIES

- A. Accessory Materials: Cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of finished surfaces.
 - 1. Abrasive pads shall be synthetic type; steel wool shall not be used.
- B. Wood Plugs: Round shape, of same species and grain orientation as flooring.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Wood: 15 percent, measured in accordance with ASTM D4442.

- D. Do not begin application of stains and finishes until substrates have been properly prepared.

3.2 PREPARATION

- A. Remove all cover plates and accessories subject to damage during sanding operations.
- B. Mask off adjacent surfaces before beginning sanding.
- C. Coordinate work of this section with installation of new products and systems. Ensure all other trades have completed work in the area of refinishing.

3.3 INSTALLATION - GYMNASIUM WOOD FLOOR FINISHES

- A. Remove existing gym floor finish in its entirety, including all floor mounted tape, game markings and logos and any other surface mounted accessories.
- B. Sand flooring with an appropriate power sander to smooth even finish with no evidence of existing finish, game lines or sander marks. Sand transitions to existing finish surfaces smooth. Use smaller hand held power sanders in areas not accessible by larger sanding units.
- C. Take precautions to contain dust. Remove dust by vacuum.
- D. Conduct post-sanding inspection, notify Architect immediately if any wood plank floors have splintered or cracked. Do not finish floors that until unsatisfactory conditions are addressed.
- E. Finishing: Apply finish in accordance with manufacturer's instructions.
 1. Apply first sealer coat, allow to dry, then buff lightly with synthetic abrasive pads to remove irregularities. Vacuum clean and wipe with tack cloth before applying succeeding coat.
 2. Apply second sealer coat in same manner as first coat and prepare for successive finishes.
 3. Apply finish coat(s), allowing sufficient drying time between coats. Lightly buff between coats and vacuum clean and tack cloth before applying succeeding finishes.
 4. Reinstall all cover plates and accessories.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
- B. Clean and polish entire floor surfaces in accordance with MFMA - Maple Flooring Manufacturer Association.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Prohibit traffic on floor finish for one week after installation.

END OF SECTION 09 64 30

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient tile/plank flooring.
- B. Resilient base.
- C. Installation accessories.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- B. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers; 1998 (Reapproved 2023).
- C. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2019a, with Editorial Revision (2020).
- D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- E. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2022.
- F. ASTM F1344 - Standard Specification for Rubber Floor Tile; 2021a.
- G. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.
- H. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- I. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Field verify actual measurements before fabrication; indicate recorded measurements on shop drawings. Indicate floor patterns, colors and seaming plan.
- D. Verification Samples: Submit two samples, 6" x 6" illustrating color and pattern for each resilient flooring product specified.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience and approved by flooring manufacturer.
 - 1. Rubber Flooring: Contractor shall have manufacturer certified installer on site at all times during rubber flooring work of this section.

1.7 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements for general requirements for mock-up.
- B. Construct tile mock-up of each product type, incorporating all components specified for the location including transitions and trims.
 - 1. Minimum size of mock-up is 6 x 6 foot.
 - 2. Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
 - 3. Approved mock-up may remain as part of the Work upon Architect approval.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 60 00 - Product Requirements for additional storage and handling requirements.
- B. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- C. Store all materials off of the floor in an acclimatized, weather-tight space.
- D. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.9 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.10 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements for closeout procedures.

- B. Furnish 10 percent of installed vinyl tile flooring and base, 5 percent of installed linoleum flooring and 5 percent of rubber flooring of each type and color specified. Deliver all required overage and maintenance stock to owner's specified location prior to start of installation.
- C. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials and suggested schedule for cleaning, stripping and re-waxing.

PART 2 PRODUCTS

2.1 TILE FLOORING

- A. Rubber Tile - Type RF-1,2,3: Homogeneous, color and pattern throughout thickness.
 - 1. Manufacturers:
 - a. Nora Flooring: www.nora.com.
 - b. Roppe Corporation: www.roppe.com/#sle.
 - c. American Biltrite; <https://www.american-biltrite.com/>.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
 - 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 4. Size: 19.26 by 19.26 inch.
 - 5. Hardness: Shore "A"; 70 minimum in accordance with ASTM D2240
 - 6. Total Thickness: 0.118 inch.
 - 7. Texture: Hammered.
 - 8. Pattern: Refer to Drawings
 - 9. Installation Method(s): Monolithic -- Refer to Drawings
 - 10. Color: As indicated on drawings.
 - 11. Product:
 - a. Basis of Design:
 - 1) American Biltrite; ABPure Tile; <https://www.american-biltrite.com/>

2.2 RESILIENT BASE

- A. Resilient Base - Type RB-1,2: ASTM F1861, Type TV, vinyl, thermoplastic; style as scheduled.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - b. Roppe Corporation: www.roppe.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 3. Height: 4 inch.
 - 4. Thickness: 0.125 inch.
 - 5. Finish: Matte.
 - 6. Length: Roll.
 - 7. Color: Refer to Finish Key and Schedule.
 - 8. Accessories: Premolded external corners and end stops.

2.3 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.

- C. Moldings, Transition and Edge Strips: Same material as flooring.
 - 1. Thickness: As required by installation and to comply with ADA Regulations.
 - 2. Color: To be selected by Architect from manufacturer's full range.
 - 3. Manufacturers:
 - a. Johnsonite, a Tarkett Company; Slim Line Transitions: www.johnsonite.com.
 - b. Roppe Corp; Rubber Accessories: www.roppe.com/#sle.
 - c. Schluter-Systems; VinPro: www.schluter.com/#sle.
- D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface. Fill excessive low areas with self leveling flowable fill. Reduce ridges or bumps by grinding.
- C. Prohibit traffic until filler is fully cured.
- D. Clean substrate to remove adhesives, coatings or contaminants that will inhibit adhesion of the new floor system. Use chemical treatment or bead blast as dictated by the existing conditions and as recommended by the flooring manufacturer .
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:
 - 1. Spread only enough adhesive to permit installation of materials before initial set.
 - 2. Fit joints and butt seams tightly.
 - 3. Set flooring in place, press with heavy roller to attain full adhesion.

- D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - 1. Resilient Strips: Attach to substrate using adhesive.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- C. Install tile to monolithic pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

3.5 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.
- E. Reveal Base: Miter all corners.

3.6 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean, seal and maintain in accordance with manufacturer's instructions.

3.7 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.
- B. Prohibit traffic on resilient flooring for 48 hours after installation.
- C. Upon completion of installation, protect resilient flooring in traffic areas with heavy duty kraft paper.

3.8 SCHEDULE

- A. Refer to Finish Keys and Schedules

END OF SECTION 09 65 00

SECTION 09 66 23
RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Epoxy matrix terrazzo with ground and polished finish.
- B. Divider strips.
- C. Precast epoxy terrazzo wall base.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Concrete subfloor with steel trowel finish.
- C. Section 07 92 00 - Joint Sealants: Sealing joints between terrazzo work and adjacent construction and fixtures.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- B. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position; 2018.
- C. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.
- D. NTMA (GRAD) - Aggregate Gradation Standards; Current Edition.
- E. NTMA (EPOXY) - Epoxy Terrazzo Specifications; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for divider strips, control joint strips, expansion joints, and sealer; include printed copy of current NTMA recommendations for type of terrazzo specified.
- C. Shop Drawings: Indicate divider strip and control and expansion joint layout, and details of adjacent components. For precast units, detail profile and anchorage requirements.
- D. Samples: Submit two samples, 6 inch by 6 inch in size illustrating each color, chip size and variation, chip gradation, matrix color, and typical divider strip.
- E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NTMA recommendations as posted at their web site at www.ntma.com unless more stringent requirements are specified.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
 - 1. Minimum ten years of documented experience.
 - 2. Associate member firm of the National Terrazzo and Mosaic Association, Inc.
- C. Surface Burning Characteristics: When tested in accordance with ASTM D635, the Epoxy terrazzo shall comply with the following value: Self-Extinguishing, extent of burning 0.25 inches maximum. ASTM D648, Critical radiant flux, 1.0.
- D. Installer Qualifications: Company specializing in performing the type of work specified in this section.
 - 1. Minimum ten years of documented experience.
 - 2. Approved by matrix manufacturer.
 - 3. Contractor member of the National Terrazzo and Mosaic Association, Inc.
- E. Single Source Responsibility: To obtain combined warranty for the installed flooring system from manufacturer; obtain primary epoxy terrazzo flooring system materials including membranes, primers, moisture vapor primers, resins and hardening agents from a single manufacturer with proof of NTMA membership. Obtain aggregates, divider strips, sealers and cleaners from source recommended by primary materials manufacturer.
- F. Warranty: Installer to warrant installation for two years upon completion of work in this Section for defects in workmanship.

1.6 MOCK-UP

- A. Section 01 40 00 - Quality Requirements: Requirements for mock-up.
- B. Construct mock-up of terrazzo illustrating appearance of finished work in each configuration required. Size mock-up to be not less than 10 by 10 feet.
- C. Locate where directed by Architect.
- D. Mock-up may remain as part of the work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Products Requirements: Product storage and handling requirements.
- B. Store terrazzo materials in a dry, secure area.
- C. Maintain optimal storage temperature of between 50 and 80 degrees F.
- D. Keep products away from fire or open flame.

1.8 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meetings.
- B. Convene minimum one week prior to commencing work of this section.

1.9 FIELD CONDITIONS

- A. Do not install terrazzo when temperature is below 50 degrees F or above 90 degrees F.

- B. Maintain ambient and substrate temperature within specified range 72 hours before, during, and 72 hours after installation of flooring.
- C. Prior to and during installation, the terrazzo contractor shall verify that the dew point is at least 5 degrees Fahrenheit less than the slab and air temperature.
- D. Provide ambient lighting level of 50 ft candles, measured at floor surface.

1.10 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Coordinate placement of terrazzo divider strips with location of mechanical and electrical access covers, floor mat frames, and other items built in to terrazzo.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Terrazzo & Marble Supply Companies; Terroxy Resin Systems: www.tmsupply.com. or Equal
- B. Other Acceptable Manufacturers - Resinous Matrix Terrazzo Flooring:
 - 1. Key Resin Company; Key Epoxy Terrazzo System: www.keyresin.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 EPOXY MATRIX TERRAZZO APPLICATIONS

- A. Floors:
 - 1. Thickness: 3/8 inch, nominal.
 - 2. Color(s): As indicated on drawings.
- B. Wall Base: Precast epoxy terrazzo.
 - 1. Thickness: Same as floors.
 - 2. Color(s): See Finish Key
 - 3. Aggregate Type and Size: Same as floors.

2.3 MATERIALS

- A. Epoxy Matrix Terrazzo: Aggregate and matrix mix applied to substrate, troweled flat, and ground smooth.
 - 1. Mix Proportions: As required to achieve appearance specified, refer to Finish Key on Drawings.
- B. Matrix: Two component resin and epoxy hardener with mineral filler and color pigment, non-volatile, thermo-setting.
 - 1. Products:
 - a. Terrazzo & Marble Supply Companies; Terroxy Epoxy Matrix: www.tmsupply.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Aggregate: Type as indicated; sized in accordance with NTMA aggregate gradation standards; color(s) as indicated, uniform in color.
- D. Finishing Grout: Epoxy, color to match terrazzo matrix.
- E. Precast Epoxy Terrazzo Units: Fabricate to sizes and profiles indicated on drawings.

2.4 ACCESSORIES

- A. Divider Strips: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features.
- B. Control Joint Strips: 1/8 inch nominal width zinc exposed top strips, zinc coated steel concealed bottom strips, 1/8 inch wide neoprene filler strip between vertical strips, with anchoring features.
- C. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.
- D. Primer: 100% solids epoxy primer as manufactured by epoxy matrix manufacturer is required.
- E. Crack Bridging Membrane: 100% solids, flexible epoxy installed at 40 mils thickness.
 - 1. Assume 100 percent coverage of slab to receive epoxy terrazzo.
- F. Patching and Fill Material: 100% epoxy fill and selected aggregates as recommended by epoxy matrix manufacturer.
- G. Base Cap, Base Divider Strip, and Separator Strip: Match divider strips.
- H. Anchors and Reinforcement for Precast Units: As recommended by manufacturer for type of installation.
- I. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not detrimental to terrazzo components.
 - 1. Products:
 - a. Terrazzo & Marble Supply Companies: www.tmsupply.com/#sle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive terrazzo.
- C. Saw cutting of concrete control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency and depth meeting ACI recommendations.
- D. New slab on grade concrete to have an efficient moisture vapor barrier directly under the concrete slab. Moisture vapor barrier shall not be punctured and shall be sealed with a vapor barrier grade flashing tape at all terminations, penetration and seams.
- E. Do not begin terrazzo work until concrete substrate has wet cured 28 days, minimum.
- F. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- G. Verify that wood subfloors have 12 percent maximum moisture content.
- H. Cementitious Subfloor Surfaces: Verify that substrates are ready for terrazzo flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by terrazzo flooring manufacturer.

- I. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Clean substrate of foreign matter.
- B. Prepare concrete subfloor by mechanically abrading surface in accordance with manufacturer's instructions to obtain a CSP within a range of 3 to 5.
- C. Prepare concrete surfaces according to ICRI 310.2R.
- D. Apply primer in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. Install divider and control joint strips in adhesive setting bed without voids below strips or mechanically anchor strips as required to attach strips to substrate.
- B. Install control joint strips straight and flat to locations indicated.
- C. Install divider strips according to pattern approved on shop drawings.
- D. Install base and border divider and control joint strips to match floor pattern.
- E. Install terminating cap strip at top of base; attach securely to wall substrate.
- F. Place terrazzo mix over substrate to thickness indicated.
- G. Expansion-Joint (isolation) strips: Separate double L-Type, positioned back to back with a minimum 1/8" to 1/4" width between. Fill areas between strips with semi flexible joint filler. Filler to match adjacent terrazzo matrix. Match material, thickness and color of the dividers strips and depth required for topping thickness indicated.
- H. Detail strip layout according to NTMA Guidelines.
- I. Anchor precast units as indicated on drawings.
- J. Install precast units using specified setting material.

3.4 FINISHING

- A. Finish terrazzo to NTMA requirements.
- B. Produce terrazzo finish surface to match approved mock-up, with 70 percent chip exposed.
- C. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method or using a dry grinder with vacuum to control dust to a 120 grit finish prior to grouting.
- D. Cleanse: Clean the floor with water and rinse. Remove excess rinse water by wet vacuum and repeat process if necessary to remove all water and grinding dust. Allow the floor to completely dry before continuing with grouting.
- E. Apply grout to fill voids exposed from grinding.
- F. Remove grout coat by grinding, using a fine grit abrasive.
- G. Hand grind vertical and curved surfaces similarly.
- H. Final finish using successive grits down to 200 - 250 grit abrasive to achieve desired final appearance.

3.5 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Flat Surface: 1/4 inch in 10 feet.
- C. Maximum Variation from Level (Except Surfaces Sloping to Drain): 1/8 inch.

3.6 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final Cleaning.
- B. Scrub and clean terrazzo surfaces with neutral pH cleaner in accordance with manufacturer's instructions. Let dry.
- C. Immediately after terrazzo has dried, apply a minimum of 2 coats of sealer in accordance with manufacturer's instructions.
- D. Polish surfaces in accordance with manufacturer's instructions.

3.7 SCHEDULE

- A. Refer for Finish Key and Schedules on Drawings for mix design, including but not limited to: aggregate type, size and color for each finish specified.

3.8 PROTECTION

- A. Protect finished terrazzo from damage due to subsequent construction until Date of Substantial Completion.
- B. Section 01 70 00 - Execution and Closeout Requirements: Protecting installed construction.

END OF SECTION 09 66 23

SECTION 09 68 13
TILE CARPETING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Carpet tile, fully adhered, and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- E. Section 09 65 00 -Resilient Flooring: Base finish and termination edging of adjacent floor finish.

1.3 REFERENCE STANDARDS

- A. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- B. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.
- D. Samples: Submit three carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit three, two inch long samples of edge strip.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.

1.6 CLOSEOUT SUBMITTALS

- A. See Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: submit maintenance procedures, recommended maintenance materials and suggested schedule for cleaning.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum two week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver carpeting materials in original mill protective wrapping with mill register numbers and tags attached. Maintain wrappers and protective covers in place until carpet is ready for installation.
- B. Deliver all required overages and maintenance stock to Owner's specified location prior to beginning installation.
- C. Store materials inside, protected from weather, moisture and soiling.

1.9 EXTRA MATERIALS

- A. See Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Supply 5 percent of carpet of each type, color, and pattern specified.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Tile Carpeting:
 - 1. Interface, Inc: www.interface.com/#sle.
 - 2. Mannington Commercial: www.manningtoncommercial.com/#sle.
 - 3. Shaw Contract: www.shawcontract.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Tile Carpeting, Type CPT-1: Tufted, manufactured in one color dye lot.
 - 1. Product: Open Air 418 manufactured by Interface, Inc: www.interface.com/#sle.
 - a. Or Approved Equal.
 - 2. Tile Size: 19.69 x 19.69 inch, nominal.
 - 3. Backing system: GlasBac Tile
 - 4. Yarn manufacturer: Aquafil
 - 5. Yarn system: 100% Recycled Content Type 6 Nylon
 - 6. Color System: 100% Solution Dyed
 - 7. Construction: Tufted Pattern Loop
 - 8. Lifetime Antimicrobial: Intersept
 - 9. Soil Stain Protection: Protekt
 - 10. Tufted Yarn Weight: 17 oz min
 - 11. Color: Refer to Finish Key .
 - 12. Installation Method: Quarter Turn

2.3 ACCESSORIES

- A. Sub-Floor Filler: type recommended by flooring material manufacturer.
- B. Moldings and Edge Strips: Rubber, color as selected by architect.
- C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.
- D. Ventilate installation area during installation and for 72 hours after installation.
- E. Maintain minimum 70 degrees F ambient temperature 72 hours prior to, during and 24 hours after installation.
- F. Precondition: All of the carpet shall be spread in a room on site 14 days prior to actual installation with the room preconditioned at a minimum of 70 degree F with humidity between 35% to 65%.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Do not mix carpet from different cartons unless from the same dye lot.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.

- I. Complete installation of edge strips, concealing exposed edges.

3.4 SCHEDULE

- A. Refer to Finish Key and Schedules.

3.5 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION 09 68 13

SECTION 09 84 16
FIXED SOUND-REFLECTIVE PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fixed sound-reflective ceiling panels.
- B. Fixed sound-reflective wall panels.

1.2 RELATED REQUIREMENTS

- A. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system.
- B. Section 09 84 30 - Sound-Absorbing Wall and Ceiling Units.

1.3 REFERENCE STANDARDS

- A. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- D. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.
- E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of sound-reflective panels with size, location, and installation of service utilities.
- B. Preinstallation Meeting: Conduct preinstallation meeting one week prior to start of work of this section; require attendance by affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's published data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, panel layout. Include the following with panel layout drawings:
 - 1. Suspended ceiling system attachment locations to building structure.
 - 2. Lighting fixtures.

3. Sprinklers.
4. HVAC vents and diffusers.
- D. Selection Samples: Manufacturer's wood samples for veneers, indicating full range of woods, grain structure, and colors available.
- E. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and suspension method.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.7 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Construct mock-up of sound-reflective panels at location as indicated by Architect.
 1. Minimum mock-up dimensions; 96 by 96 inches.
 2. Mock-up may remain as part of work.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect wood panels from moisture during shipment, storage, and handling.
- B. Deliver in factory-wrapped bundles; open bundles to allow acclimation prior to installing.
- C. Store panels flat, in dry, well-ventilated space.
- D. Protect edges from damage.
- E. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

PART 2 PRODUCTS

2.1 FIXED SOUND-REFLECTIVE PANELS

- A. Wood Sound-Reflective Panels for Ceilings, Type ACP-1:
 1. Manufacturers:
 - a. Kinetics Noise Control, Inc.; Ovation Diffuser: www.kineticsnoise.com/#sle.
 - b. RPG Acoustical Systems, Inc; Waveform Monoradial W: www.rpgacoustic.com/#sle.
 2. Surface Burning Characteristics: Flame spread and smoke developed index of Class A, when tested in accordance with ASTM E84.
 3. Sound Absorption: Noise Reduction Coefficient (NRC) or Sound Absorption Average (SAA) of 0.35 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 4. Mounting Method: Suspended from structure above.

5. Core: Medium density fiberboard (MDF) complying with ANSI A208.2, Grade 130.
 - a. Panel Radius: As indicated on drawings.
 6. Panel Size: As indicated on drawings.
 7. Face: Wood veneer, complying with HPVA HP-1 Grade A.
 - a. Species: Cherry, clear.
 - b. Grain Direction: Flat.
 - c. Grain Matching: Book.
 - d. Veneer all exposed faces.
 - e. Finish:
 - 1) Transparent Finish: Lacquer.
 - 2) Stain: None.
 - 3) Sheen: Satin.
- B. Thermoformed Plastic Sound-Reflective Panels for Walls, Type AWP-4,5:
1. Manufacturers:
 - a. RPG Acoustical Systems, Inc: www.rpgacoustic.com/#sle.
 - b. Kinetics Noise Control, Inc.: www.kineticsnoise.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Surface Burning Characteristics: Flame spread and smoke developed index of Class A, when tested in accordance with ASTM E84.
 3. Mounting Method: Direct mounted to wall.
 4. Panel Size: As indicated on drawings, nominal.
 5. Material Thickness: 1/16 inch.
 6. Product:
 - a. Basis of Design: Kinetics Noise Control: Geometric Diffusers.

2.2 FABRICATION

- A. Wood Panels: Fabricate panels to sizes and configurations as indicated, with wood veneer installed without sagging, wrinkles, blisters, or visible seams.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.
- C. Factory-applied finishes on wood veneer panels to be uniform, smooth, and without blemishes.
- D. Complete fabrication and finishing before shipment to project site.

2.3 ACCESSORIES

- A. Direct-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, supporting full weight of panels, and as follows:
 1. Z-clip hanger and magnet system with magnets recessed into panel frame and designed to engage steel mounting plates secured to substrate with screws.
- B. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each sound-reflective panel, sized appropriately for weight of panel.
- C. Provide wire hanger suspension system; see Section 09 51 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of sound-reflective panels. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install sound-reflective panels in locations indicated, following manufacturer's installation instructions, and to suit conditions.

3.3 TOLERANCES

- A. Maximum Variation From True Position: 1/16 inch.
- B. Maximum Offset From True Alignment: 1/16 inch.
- C. Maximum Variation From Flatness: 1/16 inch
- D. Maximum Variation of Joint Width: 1/32 inch

3.4 CLEANING

- A. Clean panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.5 PROTECTION

- A. Protect installed sound-reflective panels until Date of Substantial Completion.
- B. Replace panels that cannot be cleaned and repaired.

END OF SECTION 09 84 16

SECTION 09 84 30
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sound-absorbing wall panels.
- B. Sound-absorbing wall panels, custom-fabricated and metal-encased.
- C. Sound-absorbing ceiling baffles.
- D. Mounting accessories.

1.2 RELATED REQUIREMENTS

- A. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system.
- B. Section 09 84 16 - Fixed Sound-Reflective Panels.
- C. Section 09 91 23 - Interior Painting.

1.3 REFERENCE STANDARDS

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- D. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. See Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.
- D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available.
- E. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.

- F. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.
 - 1. Standard Systems: Submit certified copies of previous test reports substantiating performance of system in lieu of retesting.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
- B. Store units flat, in dry, well-ventilated space; do not stand on end.
- C. Protect edges from damage.
- D. Do not install panels until temperature and relative humidity is stabilized at 60-80 degrees F and 35% MINIMUM RH and 55% MINIMUM RH.

1.8 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements for additional mock-up requirements.
- B. Construct mock-up of acoustical units at location as indicated by Architect.
 - 1. Minimum mock-up dimensions; 96 by 96 inches.
 - 2. Mock-up may remain as part of work.

PART 2 PRODUCTS

2.1 FABRIC-COVERED SOUND-ABSORBING UNITS

- A. Manufacturers:
 - 1. Kinetics Noise Control, Inc: www.kineticsnoise.com/#sle.
 - 2. RPG Acoustical Systems, Inc: www.rpgacoustic.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. General:
 - 1. Prefinished, factory assembled fabric-covered panels.
 - 2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- C. Fabric-Covered Acoustical Panels for Walls: Type: AWP-1,3.
 - 1. Panel Core: Manufacturer's standard rigid or semi-rigid fiberglass core.
 - a. Facing: 1/16-inch high-impact, impact-resistant and tackable surface laminated to core.
 - 2. Sound Absorption: Noise Reduction Coefficient (NRC) or Sound Absorption Average (SAA) of 1.10 for 2 inch panel when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 - 3. Panel Thickness: 2 inches.
 - 4. Edges: Perimeter edges reinforced by a formulated resin hardener.
 - 5. Corners: Square.
 - 6. Edges: Beveled.
 - 7. Fabric: Woven polyester.

8. Color: As indicated.
 9. Mounting Method: Back-mounted with mechanical fasteners.
 10. Product:
 - a. Basis of Design: Kinetics Noise Control: Hardside Acoustic Wall Panels.
- D. Fabric-Covered Arcoustical Panels for Walls: Type: AWP-2.
1. Panel Core: Manufacturer's standard engineered composite core.
 - a. Facing: 1/16-inch high-impact, impact-resistant and tackable surface laminated to core.
 2. Sound Absorption: Low-frequency absorber Absorbtion coefficient in the 100 to 400 hz 1/3 octave bands to be an average of 0.79.
 3. Panel Thickness: 4 - 1/8 inches.
 4. Edges: Perimeter edges reinforced by a formulated resin hardener.
 5. Corners: Square.
 6. Edges: Beveled.
 7. Fabric: Woven polyester.
 8. Color: As indicated.
 9. Mounting Method: Back-mounted with mechanical fasteners.
 10. Product:
 - a. Basis of Design: Kinetics Noise Control: Versatune Acoustic Panel.

2.2 METAL SOUND-ABSORBING WALL UNITS

- A. Manufacturers:
1. Kinetics Noise Control, Inc.; KNP-F: www.kineticsnoise.com/#sle.
 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. KNP Perforated Metal Panels for Walls: Poly-Bagged fiberglass-or laminated fleece backing in accordance with ASTM C665; mildew resistant and enveloped by metal casing.
- C. KNP-F: 0.040 perforated aluminum cover, perforated with 3/32 inch holes on 3/16 inch staggered centers, providing 23% open area.
1. Sound Absorption: Noise Reduction Coefficient (NRC) or Sound Absorption Average (SAA) of 0.70 to 0.90 when tested in accordance with ASTM C423; for Type A mounting, comply with ASTM E795.
 2. Perforated Panel: Type: AWP-7,8,9,10.
 - a. Panel Sizes and Colors:
 - 1) AWP-7: 24 x 72 inch, RAL 7038 BTS Grey.
 - 2) AWP-8: 42 x 36 inch, RAL 7045 Averitt Grey.
 - 3) AWP-9: 24 x 36 inch, RAL 9004 Black.
 - 4) AWP-10: 24 x 36 inch, RAL 7045 Averitt Grey.
 - b. Hole Diameter: 3/32 inch, nominal.
 - c. Finish: Powder coated aluminum.
 3. Mounting: Z-clips top with L-bottom support angles mechanically anchored to wall substrates.
 - a. Edge Profile: Square.

2.3 MINERAL FIBER SOUND-ABSORBING UNITS

- A. Manufacturers:
1. Armstrong World Industries, Inc; : www.armstrongceilings.com/#sle.
 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Rigid Mineral Fiber Canopies for Ceilings; Type ACP-3
1. Sound Absorption: Noise Reduction Coefficient (NRC) of 0.95 for 1-1/4 inch thick material when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.

2. Surface Burning Characteristics: Flame Spread Index of 25, maximum; Smoke Developed Index of 50, maximum; when tested in accordance with ASTM E84.
3. Facing: 1/8-inch high-impact and tackable surface laminated to core.
4. Color: White.
5. Mounting: Hung from top surface of panel by stainless steel cables.
6. Product:
 - a. Basis of Design: Armstrong: Soundscapes Canopies, Valley Canopy.

2.4 PET FELT SOUND ABSORBING UNITS

- A. Manufacturers:
 1. Acoufelt: www.acoufelt.com.
 2. Turf Design: www.turf.design.com.
 3. Hush Acoustics; <https://www.hushacoustics.ca/>
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Polyethylene Terephthalate (PET) Felt Panels for Walls and Ceilings:
 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- C. Sound Absorption: Noise Reduction Coefficient (NRC) or Sound Absorption Average (SAA) of 0.45 to 0.85 when tested in accordance with ASTM C423 for Type A mounting, complying with ASTM E795.
- D. Ceiling Hung Vertical Plane Baffle Grid:
 1. Size: ACB-1 6" - 12" inches high by 64 inches long by 48 inches wide.
 2. Size: ACB-2 6" - 12" inches high by 52 inches long by 48 inches wide.
 3. Contour Pattern: Angled Profile.
 4. Thickness: 3/8 inch, nominal.
 5. Mounting: Hung from top edge of baffle by stainless steel cables.
 6. Product:
 - a. Basis of Design: Acoufelt - Interlace Solus.
- E. Ceiling Hung Geometric Cloud:
 1. Size: 7.5 inches high by 36 inches long.
 2. Thickness: 3/8 inch, nominal.
 3. Colors: Refer to finish key.
 4. Mounting: Hung from top surface of cloud by stainless steel cables.
 5. Product:
 - a. Basis of Design: Turf Design: Fractal ceiling cloud.
- F. Wall Mounted Vertical Plane Panel:
 1. Size: 23.62 inches high by 23.62 inches long.
 2. Contour Pattern: Reveal.
 3. Thickness: 1 inch, nominal.
 4. Mounting: Hung from back of panel by panel adhesive.
 5. Product:
 - a. Basis of Design: Acoufelt Fracture Tiles (1-5).

2.5 FABRICATION

- A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
 1. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
 2. For panels suspended from ceiling, provide fabric covering both sides, with seams only at panel edges.

- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

2.6 ACCESSORIES

- A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
 - 1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.
 - 2. Z-clip hanger and magnet system with magnets recessed into panel frame and designed to engage steel mounting plates secured to substrate with screws.
- B. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as recommended by manufacturer on each acoustical unit, sized appropriately for weight of acoustical unit.
 - 1. Stainless steel spiral hangers screwed into top edge of baffle.
 - 2. Provide galvanized wire for suspension from ceiling at heights as indicated.
- C. Fixing Clips: Manufacturers standard for application as indicated.
- D. Furring Strips: Metal hat channel.
- E. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.
- B. Install mounting accessories and supports in accordance with shop drawings.
- C. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- D. Suspend ceiling baffles and panels at locations and heights as indicated.
- E. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
 - 1. Plumb and level.
 - 2. Flatness.
 - 3. Width of joints.

3.3 CLEANING

- A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.4 PROTECTION

- A. Provide protection of installed acoustical panels until Date of Substantial Completion.

- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 09 84 30

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 91 23 - Interior Painting.

1.3 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2017).
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- E. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- F. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).

3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
4. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 1. Where sheen is specified, submit samples in only that sheen.
 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
 3. Allow 30 days for approval process, after receipt of complete samples by Architect.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.

1.6 MOCK-UPS

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 6 feet long by 6 feet wide, illustrating paint color, texture, and finish.
- C. Provide door and frame assembly illustrating paint color, texture, and finish.
- D. Locate where directed by Architect.
- E. Mock-up may remain as part of the work.

1.7 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, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

- B. Paints:
 - 1. PPG Paints: www.ppgpaints.com/#sle.
 - 2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. 6 CRR-NY, Chapter III, Subpart A.
 - c. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
 - 1) Opaque, Flat: 50 g/L, maximum.
 - 2) Opaque, Nonflat: 100 g/L, maximum.
 - 3) Opaque, High Gloss: 150 g/L, maximum.
 - d. Architectural coatings VOC limits of the State of New York.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.

- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Exterior Plaster and Stucco: 12 percent.
 - 2. Fiber Cement Siding: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 5. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 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 or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Clean concrete according to ASTM D4258. Allow to dry.
- G. Exterior Gypsum Board: Fill minor defects with exterior filler compound. Spot prime defects after repair.
- H. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- I. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- J. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

3.3 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.5 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

3.7 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON SHERWIN WILLIAMS UNLESS NOTED OTHERWISE.

- A. Concrete, Concrete Masonry Units (CMU), Concrete Block, Brick Masonry: Finish surfaces exposed to view.
 - 1. One coat of Loxon Block Surfer(LX01W0200) @ 8.8 MDFT.
 - 2. Two coats of ConFlex Acrylic Coating (CF13W0051) @ 3.5 MDFT.
- B. Exterior Gypsum Board: Finish surfaces exposed to view.
 - 1. One coat of Loxon Masonry Primer Sealer(LX02W0050) @ 3.2 MDFT.
 - 2. Two coats of ConFlex Acrylic Coating(CF13W0051) @ 3.5 MDFT.
- C. Exterior Plaster: Finish surfaces exposed to view.
 - 1. One coat of Loxon Masonry Primer Sealer(LX02W0050) @ 3.2 MDFT.
 - 2. Two coats of ConFlex Acrylic Coating(CF13W0051) @ 3.5 MDFT.
- D. Wood: Finish surfaces exposed to view.
 - 1. One coat of Exterior Latex Water-Based Wood Primer.
 - 2. Two coats Latitude Exterior Acrylic Satin.
- E. Steel - Exposed steel lintels, Overhead doors, Frames, other Ferrous metal:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats DTM Acylic Semi gloss Coating (B66-200 Series).
 - 3. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- F. Steel - Exposed steel columns and beams:
 - 1. Minimum surface preparation is to meet SSPC-SP6.
 - 2. Prime coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 3. Two coats Sher-Cryl HPA High Performance Acrylic (B66-300 Series) @ 2.5-4.0 MDFT.
 - 4. Application: Preparation and prime coat is to be applied in factory by steel fabricator.

- G. Galvanized Steel: Finish surfaces exposed to view.
 - 1. Two coats of Sher-Cryl HPA High Performance Acrylic (B66-300 Series) @ 2.5-4.0 MDFT.
 - 2. Application: Preparation and prime coat is to be applied in factory by fabricator.

3.8 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON PPG UNLESS NOTED OTHERWISE.

- A. Concrete, Concrete Masonry Units (CMU), Concrete Block, Brick Masonry: Finish surfaces exposed to view.
 - 1. One coat of Perma-Crete Block & Masonry Surfer/Filler 4-100XI @ 8.0 to 11.0 MDFT.
 - 2. Two coats of Perma-Crete 4-22 HB Acrylic Flat @ 3.2 to 5.8 MDFT.
- B. Exterior Gypsum Board: Finish surfaces exposed to view.
 - 1. One coat of Perma-Crete 4-603XI Alkali resistant primer @ 1.4 MDFT, minimum.
 - 2. Two coats of Perma-Crete 4-22 HB Acrylic Flat @ 3.2 to 5.8 MDFT.
- C. Exterior Plaster: Finish surfaces exposed to view.
 - 1. One coat of Perma-Crete 4-603XI Alkali resistant primer @ 1.4 MDFT, minimum.
 - 2. Two coats of Perma-Crete 4-22 HB Acrylic Flat @ 3.2 to 5.8 MDFT.
- D. Wood: Finish surfaces exposed to view.
 - 1. One coat of Exterior Oil-Based Wood Primer.
 - 2. Two coats of Acri-Shield Max Exterior Latex Satin.
- E. Steel - Exposed steel lintels, Overhead doors, Frames, other Ferrous metal:
 - 1. One coat of Speed Hide One-component, interior/exterior rust inhibitive steel primer 6-208 Series.
 - 2. Two coats of Pitt-Tech Plus Int./Ext Semi-Gloss Industrial Coating 90-1610 HP Series.
 - 3. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- F. Steel - Exposed steel columns and beams:
 - 1. Minimum surface preparation is to meet SSPC-SP6.
 - 2. One coat of Speed Hide One-component, interior/exterior rust inhibitive steel primer 6-208 Series.
 - 3. Two coats Sil-Shield Silicone Alkyd Enamel High Gloss 95-5000 Series.
 - 4. Application: Preparation and prime coat is to be applied in factory by steel fabricator.
- G. Galvanized Steel: Finish surfaces exposed to view.
 - 1. Two coats of Pitt-Tech Plus Int./Ext. Gloss Industrial Coating 90-1310 Series @ 2.0 - 4.0 MDFT, minimum.
 - 2. Application: Preparation and prime coat is to be applied in factory by fabricator.

END OF SECTION 09 91 13

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Elevator pit ladders.
 - 3. Surfaces inside cabinets.
 - 4. Prime surfaces to receive wall coverings.
 - 5. Exposed walls and bottom of swimming pools and fountains.
 - 6. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - d. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
 - 6. Marble, granite, slate, and other natural stones.
 - 7. Floors, unless specifically indicated.
 - 8. Glass.
 - 9. Acoustical materials, unless specifically indicated.
 - 10. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 05 51 00 - Metal Stairs: Shop-primed items.
- D. Section 09 91 13 - Exterior Painting.

1.3 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.4 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2019.
- C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2017).
- D. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2018.
- E. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- F. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
- G. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- H. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- I. SSPC-SP 2 - Hand Tool Cleaning; 2018.
- J. SSPC-SP 3 - Power Tool Cleaning; 2018.
- K. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
- L. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
 - 2. MPI product number (e.g., MPI #47).
 - 3. Cross-reference to specified paint system products to be used in project; include description of each system.
 - 4. Manufacturer's installation instructions.
 - 5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
 - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
 - 4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 10 years experience and approved by manufacturer.

1.7 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 10 feet long by 10 feet wide, illustrating paint color, texture, and finish.
- C. Provide door and frame assembly illustrating paint color, texture, and finish.
- D. Locate where directed by Architect.
- E. Mock-up may remain as part of the work.

1.8 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, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.9 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.2 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. 6 CRR-NY, Chapter III, Subpart A.
 - c. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
 - 1) Opaque, Flat: 50 g/L, maximum.
 - 2) Opaque, Nonflat: 100 g/L, maximum.
 - 3) Opaque, High Gloss: 150 g/L, maximum.
 - d. Architectural coatings VOC limits of the State of New York.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Colors: To be selected from manufacturer's full range of available colors.
 - 1. Selection to be made by Architect after award of contract.
 - 2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.

2.3 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been adequately prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Plaster and Stucco: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 5. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 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 or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Clean concrete according to ASTM D4258. Allow to dry.
 - 3. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.
- H. Concrete Floors and Traffic Surfaces: Remove contamination, using alkaline based cleaners where required, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- I. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- J. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- K. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

- L. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- M. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- N. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- O. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.3 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 and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.

3.5 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

3.7 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON SHERWIN WILLIAMS UNLESS NOTED OTHERWISE.

- A. Concrete Block:
 - 1. One coat Preprite Block Filler (B25) DFT- 8.0. (MPI #4)
 - 2. Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
- B. Concrete:
 - 1. One coat Preprite Masonry Primer (B28W300) @ 3.0 MDFT. (MPI #149)
 - 2. Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
- C. Steel and Metal - Steel access doors and frames, hollow metal doors and frames, all new removable mullions, stair railings, hollow metal Windows frames, existing painted fire extinguisher cabinets:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats DTM Acrylic Semi-Gloss Coating (B66-200) @ 2.5-5.0 MDFT per coat.
- D. Galvanized Metal: Exposed miscellaneous metal, exposed ducts, conduits, mechanical and electrical devices.
 - 1. One coat DTM Acrylic Primer/Finish (B66W1) @ 2.5-5.0 MDFT. (MPI #134)
 - 2. Two coats DTM Acrylic Semi-Gloss Coating (B66-200) @ 2.5-4.0 MDFT per coat. (MPI #153)
- E. Aluminum - Mill Finish:
 - 1. Two coats DTM Acrylic Gloss Coating (B66-100) @ 2.5-4.0 MDFT per coat. (MPI #114)
- F. Steel - Exposed steel lintels:
 - 1. One coat Pro Industrial Pro-Cryl Primer (B66-1300 Series) @ 1.9-3.8 MDFT.
 - 2. Two coats Sher-Cryl HPA High Performance Acrylic, (B66-300 Series) @ 2.5-4.0 MDFT.
 - 3. Application: Preparation and prime coat is to be applied including previously primed in factory by steel fabricator.
- G. Gypsum Board: Finish surfaces exposed to view.
 - 1. All interior drywall gypsum board wall surfaces for a painted finish. (Spot prime all areas containing joint compound with primer first)
 - a. Walls and ceilings: One coat Pro Mar 200 Zero VOC Primer (B28) DFT- 1.0. (MPI #50).
 - b. Walls: Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
 - c. Ceilings: Two coats SuperPaint Air Purifying Technology (A86 - Flat) @ 1.8 MDFT
- H. Plaster: Finish surfaces exposed to view.
 - 1. All interior plastered wall surfaces for a painted finish. (Spot prime all areas containing raw plaster with primer first)
 - a. Walls and ceilings: One coat Pro Mar 200 Zero VOC Primer (B28) DFT- 1.0. (MPI #50).
 - b. Walls: Two coats SuperPaint Air Purifying Technology (A87 - Satin) @ 1.8 MDFT
 - c. Ceilings: Two coats SuperPaint Air Purifying Technology (A86 - Flat) @ 1.8 MDFT
- I. New Wood Doors: Refer to appropriate door specification for required factory finish.

3.8 SCHEDULE - PAINT SYSTEMS: ALL MATERIALS ARE BASED ON PPG UNLESS NOTED OTHERWISE.

- A. Concrete Block:
 - 1. One coat Speedhide Masonry Hi Fill Latex Block Filler, 6-15XI. (MPI #4)
 - 2. Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss. (MPI #147)
- B. Concrete:
 - 1. One coat Perma-Crete Interior/Exterior Alkali Resistant Primer, 4-603XI Series. (MPI #3)

2. Two coats Pure Performance Interior Latex, 9-510XI Series, Semi-Gloss. (MPI #147)
- C. Steel and Metal - Steel access doors and frames, hollow metal doors and frames, all new removable mullions, stair railings, hollow metal Windows frames, existing painted fire extinguisher cabinets:
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic, Semi-Gloss 90-1610 Series.
- D. Galvanized Metal: Exposed miscellaneous metal, exposed ducts, conduits, mechanical and electrical devices.
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish, 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic, Semi-Gloss 90-1610 Series. (MPI #153)
- E. Aluminum - Mill Finish:
 1. One Coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020 over abraded surface.
 2. Two coats Pitt-Tech Plus WB DTM Industrial Enamel, 90-1310 Series, Gloss. (MPI #154).
- F. Steel - Exposed steel lintels:
 1. One coat Pitt-Tech Plus DTM Industrial Primer/Finish 4020.
 2. Two coats Pitt-Tech Plus EP DTM Acrylic Gloss 90-1510.
- G. Gypsum Board: Finish surfaces exposed to view.
 1. All interior drywall gypsum board wall surfaces for a painted finish. (Spot prime all joints and spots with primer first)
 - a. Walls and ceilings: Two coats Pure Performance Interior Latex Primer, 9-900.
 - b. Walls: Two coats Pure Performance Interior Latex, Eggshell 9-300X (MPI #144)
 - c. Ceilings: Two coats Pure Performance Interior Latex, Flat 9-100X. (MPI #144)
- H. Plaster: Finish surfaces exposed to view.
 1. All interior plastered wall surfaces for a painted finish. (Spot prime all joints and spots with primer first)
 - a. Walls and ceilings: Two coats Pure Performance Interior Latex Primer, 9-900.
 - b. Walls: Two coats Pure Performance Interior Latex, Eggshell 9-300X (MPI #144)
 - c. Ceilings: Ceilings: Two coats Pure Performance Interior Latex, Flat 9-100X. (MPI #144)
- I. New Wood Doors: Refer to appropriate door specification for required factory finish.

3.9 SCHEDULE

- A. Refer to Finish Key and Schedule on Drawings.

END OF SECTION 09 91 23

SECTION 10 14 23
PANEL SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Panel signage.

1.2 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
 - 2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - c. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment.
- E. Selection Samples: Where colors, materials, and finishes are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors, materials, and finishes specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- H. Manufacturer's qualification statement.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.

- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store under cover and elevated above grade.
- D. Store tape adhesive at normal room temperature.

1.6 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Panel Signage:
 - 1. ASI Sign Systems, Inc: www.asisignage.com
 - 2. Best Sign Systems, Inc: www.bestsigns.com/#sle.
 - 3. ID Signsystems: www.idsignsystems.com.
 - 4. Takeform: www.takeform.net/#sle.

2.2 REGULATORY REQUIREMENTS

- A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.
- B. Surface burning characteristics: Maximum flame spread of 25 (Class A) when tested in accordance with ASTM E84.

2.3 PANEL SIGNAGE

- A. Panel Signage for customer produced sign media:
 - 1. Application: Room and door signs.
 - 2. Description: Flat signs co-molded media, tactile characters.
 - 3. Sign Size: As indicated on drawings.
 - 4. Total Thickness: 1/8 inch.
 - 5. Sign Edges: Squared.
 - 6. Corners: Squared.
 - 7. Color and Font, unless otherwise indicated:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper case only.
 - c. Background Color: To be selected by architect from manufacturers standard line.
 - d. Character Color: Contrasting color.
 - 8. Material: One-piece injection molded polycarbonate plastic with raised letters and braille.
 - 9. Profile: Flat panel without frame.
 - a. Clear Cover: For customer produced sign media, provide clear cover of polycarbonate plastic, glossy on back, nonglare on front.
 - 10. Tactile Letters: Raised 1/32 inch minimum.
 - 11. Braille: Grade II, ADA-compliant.
 - 12. One-Sided Wall Mounting: Tape adhesive.
 - 13. Basis of Design Product:
 - a. ASI: InForm-FR.

- b. Or Approved Equal.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Panel Signage:
 - 1. Application: Room and door signs.
 - 2. Description: Flat signs with applied character panel media, tactile characters.
 - 3. Sign Size: As indicated on drawings.
 - 4. Total Thickness: 1/8 inch.
 - 5. Sign Edges: Squared.
 - 6. Corners: Squared.
 - 7. Color and Font, unless otherwise indicated:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper and lower case (title case).
 - c. Background Color: As scheduled.
 - d. Character Color: Contrasting color.
 - 8. Material: Acrylic plastic base with applied plastic letters and braille.
 - 9. Profile: Flat panel without frame.
 - 10. Tactile Letters: Raised 1/32 inch minimum.
 - 11. Braille: Grade II, ADA-compliant.
 - 12. One-Sided Wall Mounting: Tape adhesive.
 - 13. Basis of Design Product:
 - a. ASI: EmBoss.
 - b. Or Approved Equal.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Panel Signage:
 - 1. Application: Emergency evacuation map signs.
 - 2. Description: Flat signs for customer-produced media, tactile characters.
 - 3. Sign Size: As indicated on drawings.
 - 4. Total Thickness: 1/8 inch.
 - 5. Sign Edges: Squared.
 - 6. Corners: Squared.
 - 7. Color and Font, unless otherwise indicated:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper and lower case (title case).
 - c. Background Color: As scheduled.
 - d. Character Color: Contrasting color.
 - 8. Profile: Flat panel in aluminum frame.
 - a. Frame Finish: Natural (clear) anodized.
 - b. Clear Cover: For customer produced sign media, provide clear cover of polycarbonate plastic, glossy on back, nonglare on front.
 - 9. Tactile Letters: Raised 1/32 inch minimum.
 - 10. Braille: Grade II, ADA-compliant.
 - 11. One-Sided Wall Mounting: Concealed or exposed screws.

2.4 SIGNAGE APPLICATIONS

- A. Room and Door Signs:
 - 1. Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 2. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section for replaceable occupant name.
 - 3. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 4. Rest Rooms: Identify with pictograms, the names as indicated on room finish schedule located on drawings, and braille.

2.5 ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel or chrome plated.
- B. Exposed Screws: Chrome plated.
- C. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.2 INSTALLATION

- A. Ensure new and existing substrate surfaces are suitably cleaned prior to installation to remove dust, dirt, and other contaminants that would adversely affect tape adhesive attachment.
- B. Install in accordance with manufacturer's instructions.
- C. Install with horizontal edges level.
- D. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- E. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

3.3 CLEANING, PROTECTION AND REPAIR

- A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet interior and 10 feet exterior.
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- C. Dispose of construction debris.

3.4 SCHEDULE

- A. Refer to Signage Schedule, Signage Type Schedule and Drawings for sizes, locations and layout of signage types, sign text copy and graphics.

END OF SECTION 10 14 23

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal screens.

1.2 RELATED REQUIREMENTS

- A. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.3 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2019.
- D. ANSI A117.1 - America National Standard- Accessible and Usable Buildings and Facilities.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, door swings.
- D. Samples: Submit two samples of partition panels, 4 by 4 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.6 WARRANTY

- A. Manufacturer to supply a written warranty covering all components against breakage corrosion and delamination for a period of 25 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Solid Plastic Toilet Compartments:
 - 1. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
 - 2. ASI Global Partitions: www.asi-globalpartitions.com/#sle.
 - 3. Metpar Corp: www.metpar.com/#sle.
 - 4. Scranton Products (Santana/Comtec/Capital): www.scrantonproducts.com/#sle.
 - 5. Substitutions: Section 01 60 00 - Product Requirements.

2.2 PLASTIC TOILET COMPARTMENTS

- A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted headrail-braced.
 - 1. Color: As selected by Architect from manufacturer's full range of colors. Color to be homogeneous throughout.
- B. Doors:
 - 1. Thickness: 1 inch.
 - 2. Width: 24 inch.
 - 3. Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Toilet Stalls - Height: 55 inch.
 - 5. Pool Changing Stations - Height: 66 inch
 - 6. At Pool Changing Stations, bottom of door 6" above finish floor
- C. Panels:
 - 1. Thickness: 1 inch.
 - 2. Toilet Stalls - Height: 55 inch.
 - 3. Pool Changing Stations - Height: 66 inch
 - 4. At Pool Changing Stations, bottom of door 6" above finish floor
- D. Pilasters:
 - 1. Thickness: 1 inch.
 - 2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with two panel brackets.
 - 1. Panel bottom not more than 12" above finished floor.
 - 2. Panel top not less than 60" above finished floor.
 - 3. Panel depth not less than 18" or less than 6" beyond the outermost front lip of urinal, whichever is greater.

2.3 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: stainless steel, anti-grip profile.
- C. Wall and Pilaster Brackets: Stainless steel; continuous type.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

- E. Hinges: Stainless steel, manufacturer's standard finish.
 - 1. Continuous-type hinge, self closing.
- F. Door Hardware: Stainless steel, manufacturer's standard finish.
 - 1. Door Latch: Slide type with exterior emergency access feature.
 - 2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
 - 3. Provide door pull for outswinging doors.
- G. Coat Hook: One per compartment, mounted on door.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.3 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.4 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10 21 13.19

SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.
- C. Diaper changing stations.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Placement of concealed wood blocking and backing plates for support of accessories.
- B. Section 09 30 00 - Tiling: Ceramic washroom accessories.
- C. Section 22 40 00 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.3 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- G. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- H. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- I. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.
- J. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Samples: Submit two samples of each accessory, illustrating color and finish.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. American Specialties, Inc (ASI): www.americanspecialties.com.
 - 2. Bobrick Washroom Equipment, Inc.: www.bobrick.com
 - 3. Bradley Corporation: www.bradleycorp.com/#sle.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Provide products of each category type by single manufacturer.

2.2 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Keys: Provide 10 keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.4 COMMERCIAL TOILET ACCESSORIES

- A. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
 - 1. Size: As scheduled.
 - 2. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
 - 3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
 - 4. Products:
 - a. 600 Series manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- B. Grab Bars: Stainless steel, peened surface.
 - 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 pound-force, minimum.
 - b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Length and Configuration: As indicated on drawings.
 - d. Products:
 - 1) 3800 series manufactured by ASI.
 - 2) Substitutions: Section 01 60 00 - Product Requirements.
- C. Combination Sanitary Napkin/Tampon Dispenser with Disposal: Stainless steel, surface-mounted.
 - 1. Door: Seamless 0.05 inch door with returned edges and tumbler lock.
 - 2. Cabinet: Fully welded, 0.03 inch thick sheet.
 - 3. Operation: No charge; no coin slots.
 - 4. Identify dispensers slots without using brand names.
 - 5. Minimum capacity: 30 napkins and 27 tampons.
 - 6. Products:
 - a. 04684 manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- D. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
 - 1. Products:
 - a. 0473-1A manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.

2.5 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.
 - 1. Products:
 - a. 1224 manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- B. Shower Curtain:
 - 1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant. Heavy duty, 13 gauge, Features include: Polyester reinforced medical grade PVC, anti-static odor resistant, water repellent, wear resistant, scrubbable and colorfast.
 - 2. Seams: Bottom hem shall be double-fold and 1-1/4" wide. Curtain shall be seamless or lock stitch seams in two rows.

3. Size Repeat: 42 x 72 inches, hemmed edges.
 4. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
 5. Color: As indicated on finish key.
 6. Shower Curtain Hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
 7. Products:
 - a. Inpro; Vinyl shower curtain.. Brushstroke, Dwell.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand and L-shaped, left hand seat.
1. Seat: One-piece, pan-type, 0.05 inch stainless steel sheet, Type 304. Weld seams and grind smooth.
 2. Size: ADA Standards compliant.
 3. Products:
 - a. 8208 manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- D. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
1. Products:
 - a. 7320 manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.
- E. Towel Pin: Stainless steel, 3 inch extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
1. Products:
 - a. 7301 manufactured by ASI.
 - b. Substitutions: Section 01 60 00 - Product Requirements.

2.6 DIAPER CHANGING STATIONS

- A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
1. Material: Polyethylene.
 2. Mounting: Surface.
 3. Color: Gray.
 4. Minimum Rated Load: 250 pounds.
 5. Products:
 - a. Foundations Worldwide, Inc; Classic Baby Changing Station with Stainless Frame: wwwFOUNDATIONS.com/#sle.
 - b. Rubbermaid Commercial Products; FG781888 Baby Changing Station Horizontal: www.rubbermaidcommercial.com/#sle.
 - c. Saniflow Hand Dryer Corporation; Babymedi Horizontal: www.saniflowcorp.com/#sle.
 - d. Substitutions: 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.

- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.
- D. See Section 06 10 00 for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.4 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 51 26
PLASTIC LOCKERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic cubbies.

1.2 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2019.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.
- D. Samples: Submit two samples 3 by 3 inches in size, of each color scheduled.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect cubbie finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Solid Plastic Cubbies:
 - 1. ASI Storage Solutions: www.asi-storage.com/#sle.
 - 2. Scranton Products; Duralife HDPE Cubbies: www.scrantonproducts.com/#sle.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 APPLICATIONS

- A. Standard-Duty HDPE Cubbies: Solid plastic cubbies, free-standing with matching closed base.
 - 1. Width: 15 inches.
 - 2. Depth: 18 inches.
 - 3. Height: 45 inches.
 - 4. Locker Configuration: Three tier.
 - 5. Fittings: Size and configuration as indicated on drawings.

2.3 SOLID PLASTIC CUBBIES

- A. Cubbies: Factory assembled, made of solid plastic panels, tested in accordance with NFPA 286, homogenous color throughout.
 - 1. Material: Solid high density polyethylene (HDPE).

2. Body Construction: Manufacturer's standard for selected product.
 3. Provide filler strips where indicated, securely attached to lockers.
 4. Body Color: Refer to Finish Key.
- B. Component Thicknesses:
1. Body: Tops, bottoms, backs, and shelves 1/2 inch minimum.
 2. End Panels and Filler Panels: 1/2 inch minimum thickness.
 3. Toe Kick Plates: 1/2 inch minimum thickness.
- C. Base: Solid plastic base, 4 inches high, field assembled.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Place and secure on prepared base.
- C. Install cubbies plumb and square.
- D. Install end panels and filler panels.
- E. Install fittings if not factory installed.
- F. Replace components that do not operate smoothly.

3.2 CLEANING

- A. Clean interior and exterior surfaces.

END OF SECTION 10 51 26

SECTION 11 66 23
GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Basketball backboards, goals, and support framing.
- B. Wall mounted protection pads.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.
- B. Section 05 12 00 - Structural Steel Framing: Structural members supporting basketball systems.
- C. Section 05 50 00 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.
- D. Section 26 05 83 - Wiring Connections.

1.3 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- C. NCAA (BR) - Men's and Women's Basketball Rules and Interpretations; current edition.
- D. NFHS (Guide) - Court and Field Diagram Guide; current edition.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2019.
- G. International Basketball Federation: FIBA-Official Basketball Rules for Men and Women.
- H. Underwriters Laboratories Inc.: UL - Electrical Construction Equipment Directory.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- B. Electrically Operated Equipment: Coordinate location and electrical characteristics of service connection.
- C. Preinstallation Meeting: Convene minimum one week prior to commencing work of this section.
- D. Coordination:

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
 - 1. Electrical characteristics and connection locations.
 - 2. Fire rating certifications.
 - 3. Manufacturer's installation instructions.
 - 4. Colors available.
 - 5. Submit general construction, component connections and details, wiring diagram and electrical equipment.
- C. Shop Drawings: For custom fabricated equipment indicated, in large scale detail, construction methods; method of attachment or installation; type and gauge of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
 - 1. Shop drawings and calculations shall be signed and sealed by Professional Engineer, licensed in the State of New York.
 - 2. Plan of gymnasium at 1/8" scale. Indicate size and location of backstops and mat hoists.
 - a. Show operable backstops in fully extended and retracted positions.
 - 3. Indicate operator locations and mounting details. Include wiring diagrams for electric operators and controls.
 - 4. Indicate magnitude and location of loads imposed on building framing.
- D. Erection Drawings: Detailed dimensional requirements for proper location of equipment.
- E. Samples: Submit samples of wall pad coverings and roll-up curtain fabrics in manufacturer's available range of colors.
- F. Operating and maintenance data for each operating equipment item.
- G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Operation and Maintenance Data: Include the following:
 - 1. Description of method of operation and motor control system.
 - 2. Parts catalog with complete list of replacement parts.
 - 3. Lubrication requirements and frequency, and periodic adjustments required.
 - 4. Schematic wiring diagrams of installed electrical equipment.
- C. Certificates: Affidavit, signed by the Company field advisor and notarized, certifying that the equipment meets the contract requirements and is operating properly.

1.7 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 with minimum 10 years of experience.
- C. Manufacturer shall be represented by a local agency to provide maintenance and service of specified equipment.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's original packaging with factory original labels attached. Inspect for damage.
- B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.
- C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

1.9 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide 25 year manufacturer warranty for basketball backstop structure.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gymnasium Equipment:
 - 1. Draper, Inc: www.draperinc.com/#sle.
 - 2. Performance Sports Systems: www.perfsports.com/#sle.
 - 3. Porter Athletic Equipment Company: www.porterathletic.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 GENERAL REQUIREMENTS

- A. See drawings for sizes and locations, unless noted otherwise.
- B. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:
 - 1. NFHS (Guide) - National Federation of State High School Associations sports rules.
- C. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of Contract Documents.
- D. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
- E. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.
- F. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.3 BASKETBALL

- A. Basketball System: Backboard, and goal.
 - 1. Provide system components from a single source manufacturer for design and functional compatibility.
 - 2. Manufacturers:
 - a. Porter Athletic Equipment Company: www.porterathletic.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

- B. Ceiling-Suspended Backstop Assemblies: Capable of mounting both rectangular and fan-shaped backboards.
 - 1. Framing: Fully welded Center strut; stationary; front-braced framing.
 - a. Support steel and fittings anchored to overhead structural framing members with adjustable hangers for precise plumbing of backstop.
 - b. Heavy structural steel weldment at center strut for goal direct-through-backboard attachment to eliminate strain on backboard.
 - c. Brace assembly shall lock in place upon deployment, and be automatically released by cable hoist during retraction.
 - 2. Height Adjuster: Raises or lowers assembly by 2 feet to adjust goal height.
 - 3. Height Control System: Electric hoist that adjusts backstop with 115 volt actuator, and integral limit switches that provide automatic shut-off in both positions.
 - 4. Framing Color: As selected from manufacturer's standard selection.
- C. Backboards: Tempered glass, rectangular shaped.
 - 1. Conform to all NCAA (BR) and NFHS (Guide) requirements.
 - 2. Frame: Brushed aluminum edge, steel mounting.
 - 3. Dimensions: 42 inches high by 72 inches wide
 - 4. Markings: Integrally manufactured.
 - 5. Provide safety padding for bottom edge of backboard.
 - 6. Provide mounting kit.
 - 7. Color: As selected from manufacturer's standard selection.
- D. Breakaway Goals: Steel rim, mounted to backboard, with attached nylon net; complete with shock absorption feature and mounting hardware.
 - 1. Regulation 5/8 inch cold drawn alloy steel, formed to 18 inch inside diameter ring. Inside diameter of ring shall be positioned 6 inches from face of backboard.
 - 2. Rim shall be rigidly braced by means of formed, die cut steel braces on underside for maximum support.
 - 3. Net Attachment Device: Tube-tie.
 - 4. Finish: Powder coat orange.

2.4 WALL PADDING

- A. Wall Padding: Foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
 - 1. Surface Burning Characteristics: Flame spread index (FSI) of 25 or less, smoke developed index (SDI) of 450 or less, Class A, when tested in accordance with ASTM E84 as a complete panel.
 - 2. Flammability: Comply with NFPA 286.
 - 3. Covering: Vinyl Laminated Nylon Material, mildew and rot resistant; stapled to back of board.
 - a. Cover material shall have a certificate of flame resistance from the State of California (registered fabric No. F-140). The cover material shall be non-tear vinyl with a rip resistant quality utilizing industrial polyester filament yarn.
 - b. Color: As selected from manufacturer's standard range.
 - c. Texture: Embossed leather-look.
 - d. Fabric Weight: 14 oz/sq yd, minimum.
 - 4. Foam, Fire-Rated: Open cell polychloroprene (Neoprene), with 5.5 pcf nominal density.
 - 5. Foam Thickness: 1-1/2 inches.
 - 6. Backing Board: Oriented strand board.
 - a. Thickness: 7/16 inch, minimum.
 - 7. Panel Dimensions: 24 inches wide by 72 inches long, including nailing/fastening margins.
 - 8. Mounting: Removable; Z-clips fixed to wall and to padding.
 - 9. Manufacturers:
 - a. Porter Athletic; Fire Safe Wall Pad: www.gillporter.com/porter.

- b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Specially Shaped Padding: Same construction as standard padding; custom fabricate to fit irregularly shaped members, areas, and protrusions in gymnasium as indicated; provide padding for:
 - 1. Wall corners.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
- B. Inspect areas and conditions before installation, and notify Architect in writing of unsatisfactory or detrimental conditions.
- C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.
- D. Verify that electrical services are correctly located and have proper characteristics.
- E. Verify building structural frame and wall surfaces are ready to receive equipment.
- F. Verify finishing operations, including painting, are complete before installing equipment.

3.2 INSTALLATION

- A. Install in accordance with contract documents approved shop drawings and manufacturer's instructions.
- B. Coordinate installation of inserts and anchors that must be built in to flooring or subflooring.
- C. Install equipment rigid, straight, plumb, and level.
- D. Secure equipment with manufacturer's recommended anchoring devices.
- E. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.
- F. Separate dissimilar metals to prevent electrolytic corrosion.
- G. Install backstops in accordance with NCAA and NFHS requirements.
- H. Coordinate installation schedule with the schedules of other trades to ensure orderly and timely progress of the total work.
- I. Assemble components furnished loose for field assembly.
- J. Install backboards plumb, level, and parallel to basketball court end line.
- K. Placement of equipment relating to floor groove lines shall be coordinated with work under gymnasium flooring section.
- L. Install goals level and at elevation indicated on Drawings.
- M. Secure wall pads to block wall with 1/2" diameter bolt. Bolts staggered; (1) maximum spacing 18" O.C. Bolt holes neatly drilled.
- N. Touch up damaged finishes to match shop finish.

3.3 ADJUSTING

- A. Verify proper placement of equipment.
- B. Verify proper placement of equipment anchors and sleeves, and use actual movable equipment to be anchored if available.
- C. Adjust operating equipment for proper operation; remove and replace equipment causing noise or vibration; lubricate equipment as recommended by manufacturer.
- D. Adjust limit switches to prevent damage to equipment.

3.4 CLEANING

- A. Remove masking or protective covering from finished surfaces.
- B. Clean equipment in accordance with manufacturer's recommendations.

3.5 DEMONSTRATION

- A. Manufacturer's Representative shall demonstrate operation and maintenance of all units, winches and backboard height adjustment.

END OF SECTION 11 66 23

SECTION 12 24 00
WINDOW SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior manual roller shades.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.3 REFERENCE STANDARDS

- A. ASTM E2180 - Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials; 2018.
- B. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023.
- D. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.
- B. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- D. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.
- E. Selection Samples: Include fabric samples in full range of available colors and patterns.
- F. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

- G. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- H. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.
- I. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
- J. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience with shading systems of similar size and type.
 - 1. Manufacturer's authorized representative.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 MOCK-UP

- A. Mock-Up: Provide full size mock-up of window shade system complete with selected shade fabric including example of seams and batten pockets when applicable.
 - 1. Obtain Architect's approval of light and privacy characteristics of fabric prior to fabrication.
 - 2. Full-sized mock-up may become part of the final installation.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

1.9 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 - 1. Shade Hardware: One year.
 - 2. Fabric: One year.
 - 3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Interior Manually Operated Roller Shades:

1. Draper, Inc: www.draperinc.com/#sle.
2. MechoShade Systems LLC: www.mechoshade.com/#sle.
3. Drapery Industries, Inc: www.draperyindustries.com..

2.2 ROLLER SHADES

A. General:

1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Interior Roller Shades:

1. Basis of Design: Draper, Inc;; Clutch Operated FlexShade: www.draperinc.com/#sle.
 - a. Or Approved Equal.
2. Description: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
 - a. Mounting: Wall mounted.
 - b. Size: As indicated on drawings.
 - c. Fabric: As indicated under Shade Fabric article.
3. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Hardware Type: Universal brackets.
 - b. Material Type: Plated stamped steel.
4. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
 - a. Material: Extruded aluminum or Steel, with wall thickness and material selected by manufacturer.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Capable of being removed and reinstalled without affecting roller shade limit adjustments.
5. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
 - a. Style: Closed pocket; aluminum elliptical slat inside pocket with heat-sealed ends.
6. Manual Operation:
 - a. Clutch Operator Location: Right side, unless noted otherwise.
 - b. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
 - c. Drive Chain: Continuous loop, stainless steel, beaded ball chain, 95 lb minimum breaking strength; comply with WCMA A100.1. Provide upper and lower limit stops.
 - d. Shade Lift Assistance: Manufacturer's standard spring device contained in the idler end of roller tube to reduce force required to lift shades; as required based on shade weight.
 - e. Chain Retainer:
 - 1) Chain tensioning device complying with WCMA A100.1.
 - 2) Manufacturer's standard clip.
7. Accessories:
 - a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to mounting end caps, without exposed fasteners; clear anodized finish.
 - b. End Cap Covers: Match fascia or headbox finish.
 - c. Fasteners: Noncorrosive, and as recommended by shade manufacturer.

2.3 SHADE FABRIC

- A. Fabric - Type WS-1: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 - 1. Manufacturers:
 - a. Mermet Corporation; E-Screen - 5%: www.mermetusa.com/#sle.
 - 2. Material: Polyester Coated Fiberglass.
 - 3. Performance Requirements:
 - a. Flammability: Pass NFPA 701 large and small tests.
 - b. Fungal Resistance: No growth when tested in accordance with ASTM G21.
 - c. Antimicrobial Resistance: Greater than 95 percent reduction of bacteria when tested in accordance with ASTM E2180.
 - 4. Roll Width: 72 inches.
 - 5. Color: As selected by Architect from manufacturer's full range of colors.
 - 6. Fabrication:
 - a. If height of opening requires multiple panels of railroaded fabric, use battens at seams.
 - b. Battens: Full width of shade, enclose in welded shade fabric pocket.

2.4 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
 - 2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.2 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.4 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

3.5 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

3.6 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION 12 24 00

SECTION 12 35 83
MUSIC CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory-fabricated musical instrument storage cabinet system.
- B. Cabinet hardware.
- C. Accessories.

1.2 RELATED REQUIREMENTS:

- A. Section 06 10 00 - Rough Carpentry: Grounds and support framing.
- B. Section 06 41 00 - Architectural Wood Casework
- C. Section 09 65 00 - Resilient Flooring: Vinyl Base.

1.3 REFERENCES

- A. American Laminators Assoc. Performance Standard ALA 1985.
- B. ANSI - BHMA Standard A156.9, Grade 1.
- C. ANSI A135.4 - Basic Hardboard.
- D. AWI (Architectural Woodwork Institute) - Quality Standards.
- E. BHMA A156.9 - Cabinet Hardware.
- F. NEMA (National Electric Manufacturers Association) LD3 - High Pressure Decorative Laminates.

1.4 SUBMITTALS

- A. Section 01 30 00 - Administrative Requirements , for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit two, 4 x 4 inch size samples, illustrating cabinet finish.
- E. Samples: Submit two, 4 x 4 inch size samples, illustrating counter top finish and construction.
- F. Samples: Submit two samples of drawer pulls, hinges, and other accessories, illustrating hardware finish.
- G. Product Data: Submit applicable reference standards, performance data and application recommendations and limitations..

1.5 WARRANTY

- A. Provide manufacturer's written warranty that products not in accordance with requirements of Contract Documents within three years after date of Substantial Completion shall be corrected

promptly after receipt of written notice from Owner. Warranty is to include labor and material costs.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Pack and ship to avoid damage according to manufacturer's recommendations:
 - 1. Finish and assemble components in factory before shipment.
 - 2. Ship components in individual, sealed, labeled cartons.
 - 3. Deliver components to room designated for installation.
- B. Store products in heated indoor storage near point of installation. Retain protective packaging until installing.

1.7 ENVIRONMENTAL REQUIREMENTS:

- A. Do not install cabinets until all mortar, wet and dust producing work is completed.

1.8 FIELD MEASUREMENTS

- A. Obtain required field measurements from the Contractor and indicate on Shop Drawings.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. Wenger Corporation.
 - 2. Substitutions: Section 01 60 00 - Substitution Requirements.

2.2 MATERIALS

- A. Cabinet Wall Panels: 3/4 inch thick industrial (cabinet) grade particle board, minimum 48 pcf with thermoset polyester laminate on both sides for balanced construction.
 - 1. Color: as selected by Architect
- B. Cabinet Shelving:
 - 1. Cabinets up to 27 inches wide: One-piece high molecular blow-molded polyethylene with 1-3/8 inch radius from edge. Mount to cabinet walls with one-piece molded ST nylon clip. Shelf is to be removable.
 - 2. Cabinets over 27 inches wide: One-piece high molecular formed polyethylene with radius front edge and 3/16" wall thickness. Ribbed for structural integrity. Supported by four structural tubular members 1 1/2" x 1" x 16 ga. wall thickness with 14 gage welded end plates.
- C. Edging: Heat bonded 3mm beveled PVC edge-banding.
 - 1. Color: as selected by Architect
- D. Finish Hardware:
 - 1. Joinery Hardware: two inch, 1/4-20 panel connectors with 15mm head diameter, and steel thread inserts.
 - a. Finish: Powder paint coating: Oyster color.
- E. Cabinet Back Panel:
 - 1. Standard cabinet back to be 1/4" thick prefinished hardboard perforated with sound absorbing insulation backing.

- a. Color: Oyster to match side panels interior.

2.3 FABRICATION

- A. Fabricate and package all components in the factory and ship fully assembled to job site.

2.4 ACCESSORIES

- A. Vertical Closure Kit: Provide visual closure between wall and cabinet. Constructed of .750 inch thick thermoset composite wood to match cabinet side panels.
 - 1. Color: as selected by Architect
- B. Top Back Filler Kit: Provide visual closure between back wall and top panel of cabinet. Constructed of .750 inch thick thermoset composite wood to match cabinet top panels.
 - 1. Color: as selected by Architect
- C. Finished Back Panel: Provide panel to attach to cabinet back that is exposed. Constructed of .500 inch thick thermoset composite wood to match cabinet.
 - 1. Color: as selected by Architect

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 – Administrative Requirements: Verification of existing conditions before starting work.
- B. Field verify and coordinate blocking and support framing. Required for anchorage of casework.
- C. Field verify and coordinate location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set and secure casework in place; rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinet and counter bases to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Provide and install all trim and filler panels required to fill in all gaps between casework and adjacent wall. Provide a complete seamless installation.
 - 1. Trim and filler panels to match material and finish of cabinets. Filler panels shall be of equivalent length at each side of each run of casework

3.3 ADJUSTING

- A. Section 01 70 00 - Execution and Closeout Requirements: General Installation Requirements: Adjust installed work. Test installed work for rigidity and ability to support loads.

- B. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Cleaning installed work.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 12 35 83

SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for architectural cabinet work.
- B. Wall-hung counters and vanity tops.

1.2 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework.
- B. Section 22 40 00 - Plumbing Fixtures: Sinks.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

- G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- B. Quality Certification:
 - 1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by certification program.
 - 3. Provide designated labels on installed products as required by certification program.
 - 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.1 COUNTERTOPS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Dupont: www.corian.com/#sle.
 - 2) Formica Corporation: www.formica.com/#sle.
 - 3) Wilsonart: www.wilsonart.com/#sle.
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - 3. Other Components Thickness: 1/2 inch, minimum.
 - 4. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; square edge; use marine edge at sinks.
 - 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

2.2 MATERIALS

- A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.3 ACCESSORIES

- A. Steel Fixed Countertop Support Brackets:
 - 1. Material: Steel; ASTM A36/A36M.
 - 2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - 3. Color: Black.
 - 4. Products:
 - a. Top-Mounted: Standard Bracket.
 - b. Face Mounted: Front Mounting Bracket.
 - 5. Manufacturer:
 - a. Centerline Brackets: www.countertopbracket.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Provide solid wood blocking at all walls and countertops connected to brackets.

3.3 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.

3.4 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.5 CLEANING

- A. Clean countertops surfaces thoroughly.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 12 36 00

SECTION 12 66 13
TELESCOPING BLEACHERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Telescoping bleachers.
- B. Electric motor operators, controls, and internal wiring.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 83 - Wiring Connections: Connection of electric motors and controls.

1.3 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- C. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2020.
- D. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- I. ICC 300 - Standard on Bleachers, Folding and Telescopic Seating, and Grandstands; 2017.
- J. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2021.
- K. PS 1 - Structural Plywood; 2019.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage handling and requirements.
 - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
 - 1. Provide drawings customized to this project.
 - 2. Include Professional Engineer's seal on each sheet.
 - 3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.
 - 4. Graphics Layout Drawings: Indicate pattern of contrasting seat colors.

- D. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.
- E. Verification Samples: For each custom colored finish, submit samples of actual finish or product, for verification of color selection.
- F. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.5 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: Manufacturer's installation crew.
- C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M, AWS D1.3/D1.3M, and no more than 12 months before the start of scheduled welding work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store, in original packaging, under cover and elevated above grade.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Telescoping Bleachers:
 - 1. Basis of Design: Interkal LLC; Contour Seat Modules: www.interkal.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 TELESCOPING BLEACHERS

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
 - 1. Provide a design certified by a licensed Professional Engineer licensed in the State of New York.
 - 2. Provide a design that has been in use for at least 5 years; submit documentation.
 - 3. Design to comply with applicable requirements of NFPA 102, ICC 300, and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.

4. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
 5. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
 6. Wheelchair Spaces: Permanent open spaces at locations indicated on drawings in compliance with ADA Standards.
 7. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, roof drain leaders, and other obstructions; take field measurements prior to fabrication.
 8. Operation: Motor operated.
- B. Design Loads: Design to withstand the following loading conditions:
1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
 2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
 3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
 4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
- C. Dimensions:
1. See drawings for overall dimensions.
 2. Rows: To match existing bleachers.
 3. Rise Per Row: 11-1/2 inches.
 4. Row Depth: 24 inches.
 5. Seat Height Above Tread: 6 inches.
- D. Structural Supports: Steel; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
 2. Diagonal Bracing: Structural steel bracing, beginning no later than row 3, attached from carriage to riser to prevent sway. Capable of supporting loads of 1000 pounds of compression or tension forces.
 3. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
 4. Bolting: Use lock-washers or locknuts.
 5. Wheels: Minimum 3-1/2 inch diameter by 1-1/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
 - a. Axles: 0.5 inch, minimum for all wheels.
 6. Finish: Manufacturer's standard enamel or powder coating.
 7. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
 8. Unlocking: Automatically unlock all rows before engaging retraction mechanism.
- E. Propulsion: Friction power, integral electro-mechanical propulsion to open and close telescopic seating.
1. Two friction drive roller assemblies per section, integral to both first row column assemblies. Roller assemblies shall include two 6 inch diameter x 2-1/2 inch wide cast drive wheels with 45-durometer rubber covering.
 2. Roller assemblies shall be separated by 7 feet, minimum, per section, and linked together by continuous steel drive shaft for simultaneous operation.
- F. Motor Operation: Traction wheels, with non-marring rubber covering, using motor adequately sized for the purpose.
1. Provide UL listed electrical components and wiring.
 2. Controls: Start, Stop, Forward, and Reverse in a single control unit.
 3. Control Station: Removable twist-lock plug-in low-voltage pendant station, with first-row plug-in location for each motor.

4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
5. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
6. Electrical Characteristics: 208/230V, 5 wire, 3-phase, 60 Hz; 1/2 HP, minimum.
7. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches wide is acceptable.

2.3 SEAT AND PLATFORM COMPONENTS

- A. Seat/Fascia Assembly: Continuous, molded UV-stabilized high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout; approximately 18 inch long, 10 inch deep sections independently removable with tongue-and-groove or rabbeted interlock at end joints.
 1. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.
 2. Fire Retardance: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929; smoke developed index of 450 or less, when tested in accordance with ASTM E84, or 75 or less when tested in thickness intended for use in accordance with ASTM D2843; and burning extent of 1 inch or less when tested in thickness intended for use in accordance with ASTM D635.
 3. Provide end caps of same material and finish on each exposed end.
 4. Supports: Internal steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
 5. Seat and Row Numbers: Provide recessed pockets and number plates.
 6. Color: As selected by Architect from manufacturer's standard and custom range.
 - a. Provide for three colors to form custom logo as indicated on Drawings.
- B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints squarely seated in aluminum "H" beams.
 1. Plywood: PS 1, 5-ply polyethylene-overlaid douglas fir or southern pine, Grade C-C.
 2. Plywood Thickness: 19/32 inch, minimum.
 3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
 4. Provide end caps of same material and finish on each exposed end.
 5. Deck Supports: Structural steel, 11 gauge, minimum, spaced no greater than 60 inches on center.
 - a. Each deck support not attached to to a vertical post shall have an integral nylon roller to reduce friction and prevent binding.
 6. Nose Beam: One-piece formed steel, G60/Z275 hot-dipped galvanized, 13 gauge, minimum.
 7. Rear Riser: One-piece formed steel, minimum, G60/Z275 hot-dipped galvanized, 14 gauge, capable of capturing rear of footrest panel.
 8. Splice Plates: Sections shall be joined by splice plates of same type and thickness material being joined, 18 inches long, minimum, attached by through bolts. At rear riser, four bolts each side of joint, at nose beam, two bolts each side of joint.
 9. At aisles provide permanently attached intermediate steps of same construction and finish.

2.4 HANDRAILS AND RAILINGS

- A. Provide the following railings:
 1. Aisle Handrails: Single post self-storing railing segment mounted in center of aisle at every other row beginning at row 2.
 2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
 3. Height: 42 inches above adjacent platform or tread.

- B. Design handrails and railings to withstand the following loads:
 - 1. Concentrated Load on Handrails: 200 pounds in any direction.
 - 2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
 - 3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
 - 4. Live Load on Guardrails:
 - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
 - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel pipe or tube, with formed elbows at corners and caps at ends of straight runs.
 - 1. Steel: 1-1/2 inch minimum outside diameter, with 11 gauge, 0.12 inch minimum wall thickness; textured powder coat epoxy finish.

2.5 ACCESSORIES

- A. Fillers and Closures:
 - 1. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
 - 2. Sides of Extended Units: Vinyl curtains.
 - 3. Vinyl Curtains: 18 ounce vinyl with grommets; color as selected from manufacturer's standard palette.
- B. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations; S.A.E. Grade 5 or better.
- C. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify that electrical rough-ins have been installed and are accessible.
- C. Verify finishing operations, including painting and floor finishing are complete and sufficiently cured before installation proceeds.
- D. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Protect flooring and wall finishes from potential damage by work of this section.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

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

- B. Do not field cut or alter seats, fascia, or structural members without approval.
- C. Provide manufacturer's field representative to inspect completed installation.

3.4 ADJUSTING

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.5 CLEANING

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

3.6 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
 - 1. Location: On site using installed equipment.
 - 2. Time: As agreed between Owner and Contractor.

3.7 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION 12 66 13

SECTION 12 66 13.16
TELESCOPING BLEACHERS - POOL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Telescoping bleachers for Pool Area.

1.2 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- D. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- E. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2020.
- F. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
- H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- K. ICC 300 - Standard on Bleachers, Folding and Telescopic Seating, and Grandstands; 2017.
- L. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2021.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage handling and requirements.
 - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
 - 1. Provide drawings customized to this project.
 - 2. Include Professional Engineer's seal on each sheet.
- D. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.

- E. Verification Samples: For each custom colored finish, submit samples of actual finish or product, for verification of color selection.
- F. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 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: Manufacturer's installation crew.
- C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M, AWS D1.3/D1.3M, and no more than 12 months before the start of scheduled welding work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store, in original packaging, under cover and elevated above grade.

1.6 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Telescoping Bleachers:
 - 1. Basis of Design: Interkal LLC; Closed Deck; Excel Seat Modules: www.interkal.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 TELESCOPING BLEACHERS

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
 - 1. Provide a design certified by a licensed Professional Engineer licensed in the State of New York.
 - 2. Provide a design that has been in use for at least 5 years; submit documentation.
 - 3. Design to comply with applicable requirements of NFPA 102, ICC 300, and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.

4. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
 5. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
 6. Configurations: As indicated on drawings.
 7. Wheelchair Spaces: Permanent open spaces at locations indicated on drawings in compliance with ADA Standards.
 8. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, roof drain leaders, and other obstructions; take field measurements prior to fabrication.
 9. Operation: Manual.
- B. Design Loads: Design to withstand the following loading conditions:
1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
 2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
 3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
 4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
- C. Dimensions:
1. See drawings for overall dimensions.
 2. Rows: To match existing bleachers.
 3. Rise Per Row: 10.25 inches.
 4. Row Depth: 22 inches.
 5. Seat Height Above Tread: 6 inches.
- D. Structural Supports: Steel; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
1. Steel components shall be cold-formed from appropriate width strip stock conforming to ASTM A570 - Grade C 30KSI, ASTM A653/A653M - Grade 33 and 50, ASTM A500/A500M - Grade B 46 KSI as applicable, zinc plated.
 2. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
 3. Diagonal Bracing: Structural steel bracing, beginning no later than row 4, attached from carriage to riser to prevent sway. Capable of supporting loads of 1000 pounds of compression or tension forces.
 4. Deck Support: structural steel; 11 gauge, spaced not more than 60 inches on center.
 5. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
 6. Bolting: Use lock-washers or locknuts.
 7. Wheels: Minimum 3-1/2 inch diameter by 1-1/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
 - a. Axles: 0.5 inch, minimum for all wheels.
 8. Finish: Manufacturer's standard enamel or powder coating.
 9. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
 10. Unlocking: Provide single manual release mechanism to allow retraction of all carriages, concealed behind skirt board of first row.

2.3 SEAT COMPONENTS

- A. Seat/Fascia Assembly: Continuous, molded UV-stabilized high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout; approximately 18 inch long, 10 inch deep sections independently removable with tongue-and-groove or rabbeted interlock at end joints.
1. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.

2. Fire Retardance: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929; smoke developed index of 450 or less, when tested in accordance with ASTM E84, or 75 or less when tested in thickness intended for use in accordance with ASTM D2843; and burning extent of 1 inch or less when tested in thickness intended for use in accordance with ASTM D635.
3. Provide end caps of same material and finish on each exposed end.
4. Supports: Internal stainless steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
5. Seat and Row Numbers: Provide recessed pockets and number plates.
6. Color: As selected by Architect from manufacturer's standard and custom range.

2.4 PLATFORM COMPONENTS

- A. Platform, Tread, and Step Structure: Extruded aluminum, with ribbed surface, with joint sleeve assembly to maintain alignment at end-to-end junctions.
 1. Extrusions: Minimum 5/8 inch deep with minimum 0.09 inch wall thickness
 2. Finish: Clear anodized finish.
 3. Nosings: Matching aluminum extrusion.
 4. Front, Rear, and Intermediate Supports: Aluminum or steel channel or tube, hot-dipped galvanized.
 5. Provide end caps of same material and finish on each exposed end.
 6. At aisles provide permanently attached intermediate steps of same construction and finish.
 7. At bottom of aisles provide step in front of first riser, hinged to first platform to fold for storage.

2.5 HANDRAILS AND RAILINGS

- A. Provide the following railings:
 1. Aisle Handrails: Single post self-storing railing segment mounted in center of aisle at every other row beginning at row 2.
 2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
 3. Height: 42 inches above adjacent platform or tread.
- B. Design handrails and railings to withstand the following loads:
 1. Concentrated Load on Handrails: 200 pounds in any direction.
 2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
 3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
 4. Live Load on Guardrails:
 - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
 - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel pipe or tube, with formed elbows at corners and caps at ends of straight runs.
 1. Steel: 1-1/2 inch minimum outside diameter, with 11 gauge, 0.12 inch minimum wall thickness; textured powder coat epoxy finish.

2.6 ACCESSORIES

- A. Fillers and Closures:
 1. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
- B. Scorer's/ Timer's Table: 8 feet wide by 18 inches deep.
- C. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations; S.A.E. Grade 5 or better. All fasteners shall be stainless steel for high humidity conditions.

- D. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify finishing operations, including painting and floor finishing are complete and sufficiently cured before installation proceeds.
- C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Protect flooring and wall finishes from potential damage by work of this section.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Do not field cut or alter seats, fascia, or structural members without approval.
- C. Provide manufacturer's field representative to inspect completed installation.

3.4 ADJUSTING

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.5 CLEANING

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

3.6 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
 - 1. Location: On site using installed equipment.
 - 2. Time: As agreed between Owner and Contractor.

3.7 PROTECTION

- A. Protect installed products until completion of project.

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

END OF SECTION 12 66 13.16

SECTION 13 11 00
SWIMMING POOLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-Place concrete swimming pool with "Marcite" plaster finish, ADA ramp, and pool accessories.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 09 30 00 - Tiling: Pool deck surface finish, coping, and gutter.
- C. Section 13 11 46: Swimming Pool Equipment
- D. Section 22 10 05 - Plumbing Piping and Specialties: Piping, valves, and fittings.
- E. Section 22 51 00 - Swimming Pool Plumbing Systems.

1.3 REFERENCE STANDARDS

- A. ASTM C845/C845M - Standard Specification for Expansive Hydraulic Cement; 2018.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories.
- C. Shop Drawings: Indicate pool layout, configuration, and dimensions.
- D. Manufacturer's Installation Instructions: Indicate special installation procedures.
- E. Designer's Qualification Statement.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Operation Data: Provide operating instructions.
- I. Maintenance Data: Provide maintenance instructions, maintenance schedules.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design pool tank structural components under direct supervision of a Professional Structural Engineer experienced in design of this type of work and licensed in the State of New York.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Swimming Pool:
 - 1. Paddock Industries, Inc: www.paddockpool.com/#sle.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for pools and associated equipment.

2.3 SUMMARY OF WORK - THE WORK INCLUDES, BUT IS NOT NECESSARILY LIMITED TO THE FOLLOWING:

- A. Completely drain the entire pool, taking precautions to "float" the pool.
- B. Remove existing main drain grates and existing hydrostatic relief valves. Plug main drain piping to keep debris from entering existing piping. Take special precautions not to plug off the hydrostatic relief piping. Clean as required.
- C. Cover all ventilation ducts.
- D. Remove concrete pool walls as indicated on drawings.
- E. Remove the entire interior finishes, including tile racing lines, tile markings and both layers of "Marcite" down to the original gunite/concrete surface. Legally dispose of all removed material.
- F. Provide new VGB compliant main drain frame and grates
- G. Provide new tile markings as indicated on drawings
- H. Provide all new "Marcite" interior. Marcite to be hand applied. Use of plaster pump is strictly prohibited.
- I. Thoroughly clean entire pool area, remove temporary plugs, provide new hydrostatic valves and fill pool.

2.4 PRODUCTS:

- A. Marcite Interior Finish:
 - 1. Job Conditions:
 - a. Apply plaster in swimming pool only when ambient temperature is above 40 degrees F and below 90 degrees F, and protect applied plaster from rapid drying until curing is completed and pool is filled with water
 - 2. Material:
 - a. Portland Cement: ASTM C150, Type 1 white Portland cement
 - b. Aggregates for Pool Plaster Finish Coat: White marble dust uniformly graded within the following limits, all passing the No. 30 sieve:
 - 1) No. 30: Minimum 0, Maximum 0
 - 2) No. 50: Minimum 25, Maximum 50
 - 3) No. 100: Minimum 75, Maximum 90
 - 4) No. 200: Minimum 90, Maximum 100
 - c. Water: Clean, fresh, from domestic potable water source
 - 3. Proportions and Mixing:

- a. Materials and specified on a volume basis and shall be measured in approved containers which will insure that the specified proportions will be controlled and accurately maintained during the progress of work. Measuring materials with shovels (shovel count) is not permitted.
 - b. White Marble Pool Plaster Finish Coat: Mix finish in proportion of one part by volume of white Portland cement to not more than two parts by volume of aggregates (specified with marble dust).
 - c. Mixing: Perform mixing in approved mechanical mixers of the type in which quantity of water can be controlled accurately and uniformly. Avoid excess mixing to prevent hasty solution of cement and discard plaster that has begun to set up.
 4. Preparation of Surfaces:
 - a. Clean base surfaces of projections, dust loose particles, grease, bondbreakers, and foreign matter; make sufficiently rough to provide a strong mechanical bond. Wash entire concrete pool shell with an acidic solution within 24 hrs of plastering. Do not apply plaster directly to the surfaces of masonry or concrete that are coated with any acidic solution compound or similar agent until compound or agent is completely removed by water blasting. Thoroughly wash entire surface with 2,000 psi high pressure water immediately prior to plastering. Wet cementitious base surface with fine fog water spray to produce a uniformly moist condition and check screeds, pool equipment, and accessories for correct alignment before plastering is started.
 5. Application of Plaster:
 - a. General: Apply finish plaster to minimum 1/2 inch thickness at any and all locations. Apply finish plaster by hand only, to ensure required minimum thickness. Control fluidity of plaster to have a slump not exceeding 2-1/2 inches when tested using a 2" by 4" by 6" high slump cone. Perform slump testing throughout the process.
 - b. Workmanship: Apply finish plaster in two coats by "doubleback" method with second coat being applied as soon as the first is tamped and initially floated. Work plaster to screeds at intervals from 5 feet to 8 feet on straight surfaces.
 6. Curing: Keep plaster damp until pool is filled. Prevent damage and staining of plaster.
- B. Tile Markings and Lane Targets:
 1. The tile markings for the swimming pool shall be 1" x 1" tile conforming to ANSI A137.1-2012.
 - a. Setting Material:
 - 1) Portland cement: ASTM C-150, Type 1
 - 2) Sand: ASTM C-144
 - 3) Water: Clean and drinkable
 - b. Grouting Material
 - 1) Floors and Wall: Commercial white color sanded Portland Cement Type, L&M acid-R, Upco Hydroment, Kiser, Custom or Jamo.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify excavation surfaces are clean, smooth, and without voids or irregularities.
- B. Verify grounding of electrical and metallic components before shotcreting.

3.2 INSTALLATION - ACCESSORIES

- A. Install pool accessories and fittings in accordance with component manufacturer's instructions.

END OF SECTION 13 11 00

SECTION 13 11 46
SWIMMING POOL EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pool Equipment and Accessories.
- B. Pool Timing Equipment.

1.2 RELATED REQUIREMENTS

- A. Section 09 30 00 - Tiling: Pool tank surface finish and depth markings.

1.3 COORDINATION

- A. All Prime Contractors, whether specifically indicated or not, shall coordinate with all other Trades and the Construction Manager for placement of pool equipment, including but not limited to, those occupying common space.
 - 1. Include the Architect/Engineer and Owner as required for location and placement of pool equipment above grade.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on accessories, and all materials specified.
- C. Shop Drawings: Indicate pool layout, configuration, equipment locations, dimensions, and utility rough-in locations.
- D. Manufacturer's Installation Instructions: Indicate special installation procedures.
- E. Installer's Qualification Statement.
- F. Maintenance Data: Provide maintenance instructions, maintenance schedules .

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 10 years of documented experience.

1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Timing and Scoreboard System:

1. Contractor shall warrant completed system installation for one year from date of Substantial Completion.
2. Manufacturer shall further warrant the following components for period indicated from Substantial Completion:
 - a. Titanium Deck Plates: Five years.
 - b. Display board/scoreboard, and touchpads: Three years.
 - c. Starting System: Two years.
 - d. All other components including computers: One year.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Kiefer Aquatics: www.kiefer.com.
- B. Paddock Industries, Inc: www.paddockindustries.com.
- C. Recreonic, Inc.: www.recreonics.com.
- D. Substitutions: See Section 01 60 00 -Product Requirements.

2.2 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for pools and associated equipment.

2.3 SWIMMING POOL EQUIPMENT

- A. Fast Track Starting Platforms:
 1. The platform shall be side mounted and have a 24" wide x 32" long stainless steel top with non-slip solid surface.
 2. Backstroke starting bar, mounted flush with front edge of platform and two additional vertical backstroke grips made of stainless steel positioned 15" on center.
 3. Lane numbers will be visible from all four sides of platform.
 4. On top of starting platform shall be equipped with side rails made from 1" O.D. stainless steel tube welded to 1/8" stainless steel plate.
 5. Mounted to side rails will be a removable "wedge" made of 12 gauge, stainless steel with a 45 degree incline on the surface facing forward to pool. Front surface shall have a non-slip surface. The wedge will use spring loaded plunger pins to lock securely into place. Single mechanism will be used to retract both pins simultaneously with one hand for ease of adjustment. Wedge shall slide uninhibited along guide rails on sides of platform.
 6. Color: As selected by Architect from manufacturer's full range of colors with custom logos.
 7. Products:
 - a. Paddock Industries; Model 4912 Fast Track Starting Platform Stainless Steel Type 316L.
 - 1) Quantity: Six.
 - b. Paddock Industries; 4912-A anchors with 19" spacing.
- B. Wave Quelling Racing Lanes
 1. Racing lane markers consisting of individual wave reducing float segments measuring 6 inches in diameter strung on vinyl plastic covered aircraft type stainless steel to form a continuous line. Manufacturer's standard attachment clip on each end for installation and removal.
 2. Length: 25 yards with 15 feet at each end in solid color with alternating 1 foot sections of contrasting colors in between.
 - a. Color(s): As selected by Architect from manufacturer's standard line.

3. Provide storage reels on rollers for storage of the racing lines.
4. Products:
 - a. Kiefer Aquatics; Wave Eater II.
 - 1) Quantity: 5
 - b. Kiefer Aquatics; Model 210300 Racing Lane Storage Reel.
 - 1) Quantity: 2.
- C. Line Anchors
 1. Recessed stainless steel cup anchors. Anchors are to be installed in from face of stainless steel gutter system at pool water level.
 2. Product:
 - a. Paddock No. 9026.
 - b. Quantities:
 - 1) For Racing Lines: 10.
 - 2) For Life Line Attachment: 2.
- D. Life Line
 1. Lifeline shall be 3/4 inch blue and white polyethylene rope.
 2. Cast bronze metallic bodies with heavy chrome plate on all surfaces secured to line at each end for attachment to line anchors.
 3. Floats: Five inches in diameter by nine inches long multi-compartment polyurethane with chlorine inhibitors. Floats shall be self locking on the line to prevent movement along line.
 4. Product:
 - a. Paddock Floats; No. 4778.
 - b. Paddock Rope; No. 4747.
 - c. Quantity: 1.
- E. Storage Benches
 1. Heavy duty fiberglass panels over cast aluminum frame forming benches with bottom panel.
 - a. Heavy duty hinges.
 - b. Color: As selected by Architect from manufacturer's full range.
 - c. Provide matching end panels to meet configuration detailed on drawings
 2. Product:
 - a. Recreonics, Inc; Model 14-364: www.recreonics.com.
- F. Backstroke marker posts:
 1. Provide 4 each 1.90" o.d. x .06" wall 7'-4" high backstroke marker posts constructed of Type 304 stainless steel, Paddock No. 4905, complete with Paddock No. 4815 stanchion with removable caps and flags.
- G. Rails
 1. California Style Grab Rails, deck mounted, 1.9 inch o.d. x 0.83 inch thick Type 304 stainless steel, complete with deck anchors and escutcheon plates.
 2. Product:
 - a. Paddock No. 4497-C
 - b. Quantity: 4 pairs.
- H. Swimsuit Dryer
 1. Type 304 stainless steel construction.
 2. Electrically operated high speed spin dryer to remove water from swimsuits.
 3. Manual start by hand pressure on the lid; cycle time approx. 8 seconds..
 4. Power requirements: 120 VAC, UL certified.
 5. Product:
 - a. Extractor Corporation; Suitmate.
 - b. Quantity: 1.
- I. Portable Lifeguard Chair

1. Type 304 stainless steel construction from welded 1.90 inch x 0.065 inch tubing.
2. Molded fiberglass seat with swivel.
3. Permanently attached wheels that disengage when stand is in place and engage by lifting opposite end for movement.
4. Product:
 - a. Recreonics; Model 12-501.
 - b. Quantity: 4 each.

J. Diving Board and Stand

1. Aluminum springboard; 16 foot with slip-resistant finish.
 - a. Underside protected from direct contact with fulcrum by rubber channels.
2. Multi-component stand for mounting springboard 1 meter above water level.
 - a. Constructed of heavy duty aluminum castings with epoxy powder coating.
 - 1) Ladder assembly
 - (a) Wide steps with replaceable slip resistant treads.
 - (b) Hard-anodized, forged aluminum hinges mounted to anchor plate for attachment of rear of springboard.
 - 2) Fulcrum assembly
 - (a) Adjustable fulcrum point on geared carriage mounted to main support assembly.
 - (b) Adjusts manually by hand from pool deck or by foot from springboard.
 - 3) Main support assembly
 - (a) Support base for fulcrum assembly and extensions for handrail attachment.
3. Double stainless steel handrails on both sides from ladder assembly and past the main support assembly.
4. Products:
 - a. Board: Duraflex International; Model 66-231-326: www.duraflexinternational.com.
 - b. Stand: Duraflex One-Meter Stand.
 - c. Quantity 2 each.

2.4 POOL TIMING EQUIPMENT

A. Basis of Design Manufacturer:

1. Colorado Time Systems, Inc: www.coloradotime.com.
 - a. Product model numbers are that of the BOD manufacturer, and provided as quality reference for comparison.
2. Substitutions: See Section 01 60 00 - Product Requirements for substitution procedures.
 - a. Alternate manufacturers shall be capable of providing a complete system with compatible connectivity and functionality as the specified system.

B. Timing System

1. Timer shall be a standalone unit with physical connections to timing inputs. Timer shall be controlled by user interface device (computer) via network connection.
2. Timer user interface (computer) shall be supplied with all necessary software to time and score swimming in compliance with the appropriate sanctioning body(ies): World Aquatics, NCAA, YMCA, USA Swimming, and National Federation of High Schools. One laptop must be provided per timer (Legacy solution).
3. Timing System shall:
 - a. Accept inputs for up to 12 lanes for a parallel wiring installation.
 - b. Time to a user-selectable resolution from 1 second to .001 second. It shall take starts and finishes from the near end and/or far end of the pool. It shall accept inputs from the start system, touchpads, up to three manual backup times per lane, and relay judging platforms.
 - c. Run off of a 12 Volt power supply connected to a standard 110/240 VAC outlet and will automatically switch to (and display on screen of connected interface device)

- internal battery source power, in case of line power failure without affecting the continuity and accuracy of the timing system.
- d. Interface to single- and multi-line scoreboard and shall post immediate results to scoreboard in "Lane" or "Place" order. The timer shall also have the capability to pull race results from memory and post those results to the scoreboard in "Lane" or "Place" order.
 - e. Capable of communicating wirelessly with CTS wireless scoreboards (2.4GHz) using wireless communication.
 - f. Include internal clock calendar with self-sustaining battery to time/date stamp all results.
 - g. Meet acceptable safety standards. Shall be ETL approved, or equivalent.
 - h. Display complete race status. The interface shall be capable of functioning as a miniature scoreboard displaying information simultaneously for all active lanes including lane number, current length in race or final place, split or finish time, relay judging status indicator, and backup time and backup button status.
 - i. Store all race data, including near and far end splits, to internal memory for later recall to facilitate meet management connectivity and printing. Printed reports shall include cumulative and subtractive splits as well as relay judging times.
 - j. Provide backup time via push button provided on a per lane basis should swimmer fail to trigger touchpad or touchpad fails to register. Timer to be capable of accepting up to three backup button times per lane.
 - k. Relay judging automatically compares the touchpad hit of an incoming swimmer with the starting swimmer's time of departure from the optional relay judging platform. Results display both "plus" and "minus" takeoff times and can be printed and stored in race memory.
 - l. Communicate with meet management peripheral software on a two-way "handshake" basis, enabling the meet manager's resident computer to query the timer's memory via the network at any time for any race results.
 - m. The system's Automatic Event Sequencer shall be capable of accepting downloaded event order from meet management software or NFHS standard event line-up.
 - n. Automatically flag timing discrepancies (in the user interface, on the results printouts, and in stored memory) greater than .30 seconds between touchpad and backup times.
 - o. Have touchpad delay feature with ability to program delays from 1 to 99 seconds.
 - p. The software shall permit operation of essential functions including Lane Off/On, Finish Arm, Split Arm, and Print Results directly from the main screen to ensure speed and simplicity of operation during critical race times. The interface shall permit the operator to insert a backup time when required (edit) or to disqualify (DQ), automatically posting it to the scoreboard, and provide automatic re-ranking of results. Any corrections generated by the operation (edit or DQ) shall be clearly identified on the results printouts.
 - q. Permit the operator to correct for an erroneous touch by adding/subtracting a touchpad hit to correct the lengths completed. The interface shall not permit the operator to finish a race in any lane; timers including such a function are unacceptable because they permit the possibility of cheating.
 - r. Include electronic beeper and LED signaling to indicate touchpad, backup button, and relay judging inputs. Timers which do not allow the user to configure (enable/disable) this feature are unacceptable.
 - s. Timer connectivity shall include:
 - 1) USB (Type A) port for external storage.
 - 2) USB (Type B) port for meet management connectivity.
 - 3) USB (Type B) port for user interface computer connectivity.
 - 4) Ethernet port for network connectivity.
 - 5) Wireless 2.4GHz for CTS wireless scoreboard connectivity.
 - 6) Three independent scoreboard output ports.

- 7) Redundant near and far end connections timing inputs (touchpads, backup button, relay judging platforms) for up to 12 lanes.
 - 8) Start system connection directly to timer.
 - 9) External DC power port.
 - t. Be capable of updating internal software/firmware via Internet connection.
 - u. Timer software must have the ability to adjust the intensity of LED scoreboard brightness.
 - v. When recalled from memory, race distance and descriptions are automatically selected for the operator.
 - 4. Printouts shall be on a printer connected to the timer user interface. Printout of race results shall be switch selectable in "Lane" or "Place" order, or both. A single keystroke shall print touchpad and backup button times. Printout shall include race number, event/heat number, event description to facilitate meets, and time & date stamp for each race. The system will allow the user to select any of 8 different data to be printed. Printout of relay judging to include both "plus" and "minus" takeoff times for each leg of the relay.
 - 5. Product
 - a. Model GEN7LEGACY SWIM TIMER
 - 1) Quantity: One.
- C. Swim Timing Start System
 - 1. Automated audio or visual timing start system capable of driving up to 20 individual lane/block speakers, or 2 underwater/aux speakers, relay judging platform strobe lights, and deck side start indicators with microphone.
 - 2. Portable metal non-corrosive enclosure, mounted on included tripod.
 - 3. The system shall have external connections for speedlights/additional external visual indicator/strobe light(s), Visual Start Sequence Controller, start output and speaker output.
 - a. User configurable outputs for speaker, strobes, and tones via onboard help menus on LCD screen.
 - 4. Battery operated with status indicator; rechargeable with external power supply.
 - 5. Products:
 - a. Model SSE - Champion Elite Start System with TR-3 Tripod.
 - 1) Quantity: One each.
 - b. Model CMP-WP25 foot jumper cable to wall plate.
 - 1) Quantity: One.
- D. Visual Start Sequencing System
 - 1. Includes one External Visual Indicator per lane, VSS Controller, push button, connection cables, harness, splitter and carrying case.
 - 2. User configurable to function as lane indicator or strobe.
 - 3. Product:
 - a. Model EVI-SYS-6 - External Visual Indicator.
 - 1) Quantity: One set.
- E. Speakers
 - 1. Underwater PVC and EPDM watertight construction speakers.
 - a. UL approved for low voltage underwater applications with 180dB sonic output.
 - b. Connects directly to Swim Timing Start System.
 - c. Product:
 - 1) Model SP-UND.
 - (a) Quantity: .
 - 2. Auxiliary Speakers
 - a. 40 watt 8 ohm
 - b. Product:
 - 1) Model SP-125.

(a) Quantity: Two each.

F. Wall Plate & Accessories

1. Termination point for connections between deck cables, timers, start system, scoreboards, and other wall plates.
2. Capable of connecting 50 wire military type connectors through a single connector, to prevent accidental disconnection.
3. Mounts to 12 x12 inch junction box, finished flush to wall. Mount no closer than 18 inches above finished floor.
4. Products:
 - a. Model WLP-A -Wallplate, Basic Timing.
 - 1) Quantity: Two each.
 - b. Model CHI-25-CPUA -Cable, Wallplate to Timing Console, 25 foot.
 - 1) Quantity: One.
 - c. Model CMP-WP25-Cable, Champstart to wall plate, 25 foot.
 - 1) Quantity: One.

G. Touchpad System

1. Gutter hung all plastic exterior with uniform fine grit non-abrasive surface to prevent slippage.
 - a. Field verify gutter dimensions prior to fabrication.
2. Dimensions: 78 inches wide by 22 inches tall x 0.366 inches thick.
3. Contrasting colors with black end-wall cross pattern.
4. System to include touchpads, 6-lane wiring harness, pushbuttons, touchpad meter and vacuum pump, and integratable with the timing system.
 - a. Provide addition
5. Products
 - a. Model TP-78G -Aquagrip gutterhung touchpads.
 - 1) Quantity: Eight.
 - b. Custom gutter brackets -Special size Touchpad brackets.
 - 1) Quantity: Eight.
 - c. Model CAD-TP/P -Touchpad caddy for gutter hung touchpads.
 - 1) Quantity: One.
 - d. Model PB-6 - Pushbuttons.
 - 1) Quantity: Fourteen total.

H. Relay Judging Platform

1. Pressure sensitive platform to electrically indicate when a swimmer has left the starting block in relation to the incoming swimmer's touch of the touchpad.
 - a. Accuracy to be within 1/100th of a second.
2. Non-skid surface to prevent slippage.
3. Mounted or strapped to starting blocks.
4. Platforms to include Speedlights; LED lights that flash with the start signal for competitive swimming competitions.
5. Product
 - a. Model RJPLD-2432 -CTS Relay Judging Platform with built-in LED Light for Start Reaction.
 - 1) Quantity: Six each.
 - b. Model CAD-RJPL-2 - Relay Judging Platform Caddy. Holds up to 10 platforms.
 - 1) Quantity: One.

I. In-Deck Plates

1. Cover plate permitting plug-in connection for touchpads, back-up buttons, relay judging, start lights and speakers, and start signals.
2. Resistant to pool water exposure, profiled to shed water, with titanium plug-in contacts.
3. Titanium deckplates require a 4 x 4 inch junction box, mounted that deck plate shall be flush with deck tile.

4. Product: Model TDP-200.
 - a. Quantity: Six each.
- J. Backstroke Start Device
 1. Self-retracting anti-slip backstroke wedge with 10 degree angle.
 2. Starting block mounted by anchor or strap.
 3. Product
 - a. Model 143081-C.
 - 1) Quantity: Six.
- K. Scoreboard
 1. LED horizontal display Six-Lane scoreboard system.
 2. Display Includes:
 - a. Six Lane, Place, and Time Lines.
 - b. One Home/ Guest Score Line.
 - c. One Event/ Heat Line.
 - d. Two Facility Name Panel.
 3. LED Digits 10 inches high, minimum in red or amber, with 8 levels of brightness between 500 and 6500 nits.
 4. Each line of scoreboard can have up to eight operable digits, eight operable decimals, and one operable colon to provide maximum display flexibility.
 5. Each line of scoreboard shall have an internal data selector switch to permit owner/operator selection of data codes to be installed at each line of scoreboard. Data select codes may be manually changed at the scoreboard or logically changed from the timer console.
 6. Each line of scoreboard shall have an individual internal power supply and individual control circuit to limit loss of data to one line if a malfunction should occur or to permit its use an independent line of scoreboard.
 7. Each line of scoreboard shall have true multi-sport capability through the use of sliding digits to permit reformatting to desired configurations. Digits shall move freely without the use of hand tools.
 8. Capable of being used in a time-of-day mode when not being used in display modes with swim timer connected.
 9. Standard unistrut, galvanized steel channel mounting hardware, data cables.
 10. Power requirements: 120 VAC, 2 amp per module, maximum.
 11. Provide facility name panels.
 - a. Artwork or copy furnished by Owner prior to order.
 12. Products
 - a. Model LED-R - Six-lane LED Scoreboard
 - 1) Quantity: One.
 - b. Model LED-SPW - Enclosed panel white with facility name and CTS logo.
 - 1) Quantity: Two.
 - c. Model LED6-EH -Single-Line 6 digit Event/Heat Line.
 - 1) White letters on red lexan or yellow letters on clear lexan, EVENT/HEAT.
 - 2) Quantity: One.
 - d. Model LED6-HG -Single-line 6 digit Red LED Scoreboard -Quantity (1)
 - 1) White letter on red lexan or yellow letters on clear lexan, HOME/GUEST.
 - 2) Quantity: One.
- L. Diving Scoring System Software
 1. Diving Scoring System Software shall support standard and synchronized scoring.
 - a. Accept five judges' input scores and compute award based upon proper formulas for five judges. Software shall be operable with either remote judges' terminals or manual input of flash card scores.
 - b. System must be expandable to use up to fifteen judges scoring terminals.

- c. Permit display of the lead diver number, current diver number, dive number, degree of difficulty, judges' scores and diver's calculated award and total score.
 - d. Permit entry of all diving data into non-volatile memory for storage or receive data from meet management computer without additional modifications. Data shall include diver number, round number, dive number, and position. Degree of difficulty shall be automatically calculated based upon dive number per current World Aquatics/USD/NCAA/High School regulations. Dive degree of difficulty can also be manually input.
 - e. Automatically recall the diver with round number, dive number and DD using minimal keystrokes. Systems which require live entry of dive information are unacceptable.
 - f. Permit storage of diver's point totals and provide ranking of the divers at the end of each round.
 - g. Permit editing of judges' scores if required by meet officials.
 - h. Provide an output for computer data handling of diving events.
 - i. Permit two point deduction from the judges' scores and zero points for a failed dive. Such changes shall be clearly shown on the printout.
 - j. Printout shall provide preliminary data, diver ranking by rounds, and results of individual dives with judges' scores.
 - k. Judges' terminals shall be housed in sealed, water-resistant, shockproof housing.
 - l. The terminals shall provide a signal to inform the judge that the diving console has requested a score. Signal shall cease when an appropriate score is transmitted. They shall also allow each judge to input a score with a minimum of keystrokes, review that score via a built-in LCD display, and correct a score if needed before transmitting to the Judging Software.
 - m. The Software shall provide a switchable mode for sending data to the scoreboard display.
 - 1) Mode- Automatic- In this mode the software must send the judges scoring information to the display with no software operator interaction.
 - 2) Mode- Hold for Authorization – In this mode the software must receive authorization from a referee terminal or an assistant referee terminal prior to sending the scoring data to the display.
2. Remote judging terminal and interface shall be as follows:
- a. Interface hub shall plug into the PC via USB 2.0 or greater
 - b. Judges terminals shall include a quick release mating connector for connection to the Diving Cable Breakout Box.
 - c. Judges' terminals shall include rugged communications cable to connect to the diving interface box. Cable should be removable for easy cost effective replacement of the cable.
 - d. Judges' terminals shall utilize sealed keyboards with a 128x64 Pixel Backlit LCD display suitable for indoor and sunlight readability.
 - e. Judges terminal LCD must be capable of displaying:
 - 1) Divers Name.
 - 2) Divers Team or Country Name.
 - 3) Scores of other judges once the scores have been accepted.
 - 4) Dive and Dive Degree of Difficulty.
 - 5) Terminal Number so they can be easily identified to the judge.
 - f. Judges terminals shall include a request change button to notify the software that the judges input is requesting permission to correct the submitted score.
 - g. Judges terminals must be able to be assigned as a Referee's terminal or Assistant Referee's terminal allowing the device to control when the judging data is transmitted to the scoreboard display.
 - h. Product
 - 1) Model JT-01 - Judging Terminals with associated cables.
 - (a) Quantity: Five.
 - 2) Model IH-01 - Interface Hub Box with associated cables.

- (a) Quantity: One.
 - 3) Model CB-01 - Cable Breakout Boxes with associated cables.
 - (a) Quantity: Two.
 - 4) Software to be installed on Owner provided Windows laptop.
- M. Slim Pace Clock with Time of Day Function
 - 1. Four digit Slim pace clock with integrated real time of day chip.
 - 2. Red or amber LED digits shall be 13 inches high.
 - 3. Integrated 2.4GHz wireless with 12 operating channels to eliminate interference and synchronize time automatically with other slim pace clocks within the facility.
 - 4. Digits and circuitry must be conformal coated to protect against corrosion.
 - 5. LED digits must have variable intensity setting.
 - 6. Able to be used for either pace clock or time of day clock (hours and minutes or minutes and seconds).
 - 7. Enclosure: Powder-coated aluminum.
 - 8. High gain flush mount patch antenna will be mounted on an LED digit and protected by a Lexan cover to prevent breakage by errant balls and/or weather.
 - 9. Dimensions: 19.25 inches H x 42.25 inches W x 2.8 inches D.
 - 10. Controlled by a segment timer (WHC-2) for training purposes.
 - 11. Wall mounted for indoor or outdoor use.
 - 12. Products
 - a. Model SP-1400 - Slim Pace Clock.
 - 1) Quantity: Two.
 - b. Model K-TRIM-8 - Cord Cover Kit.
- N. Wireless Handheld Controller for Segment Timer
 - 1. Wireless handheld controller shall allow operator to program:
 - a. Up to 10 programmable sets.
 - b. Reps
 - 1) Up to 50 programmable reps for each set
 - 2) Hours can be set from 0 – 99
 - 3) Minutes can be set from 0 – 99
 - 4) Seconds can be set from 0 – 99
 - 5) Each rep can be set to count up or count down
 - 6) Beep can be programmed from 0 – 9 seconds
 - 2. Capable of operating 2.4GHz slim pace clocks.
 - 3. Capable of selecting a specific wireless scoreboard address to send data to.
 - 4. Run on (2) AA alkaline or rechargeable batteries.
 - 5. Have an operating distance up to 1,000 ft.
 - 6. Display must be transfective LCD screen that is easily readable in all environments from darkness to bright sunlight.
 - 7. Operate on 2.4GHz wireless and be FCC, CE, and RoHS compliant.
 - 8.
 - a.
 - 1) Quantity: Two.
- O. Pace Clock
 - 1. Portable pace clocks with four 10 inch LED digits (red or amber), with minimum of 15 LED intensity settings, and the capability to adjust the LED intensity via the selectable dial.
 - 2. Pace Clock Pro electronic training device shall be provided, enabling swimmers to perfect their starts, relay exchanges, and turn speeds.
 - 3. Capability of being programmed by a handheld console (UPC-C) for pacing functions.
 - 4. Pace clock/shot clock shall operate on AC power or two internal rechargeable 12 volt Lead Acid batteries. The internal battery will automatically be recharged while the clock is plugged in to the external power supply.
 - 5. Pace clock shall have a battery life of 6 hours/internal rechargeable battery.
 - 6. Capability of being located anywhere on the deck or mounted on a wall.

7. Pace clock shall have 5 ports to operate in conjunction with the following Colorado Time Systems equipment: push button(s), relay judging platforms, start system, and two touchpads.
8. Capable of connecting to other PC-PRO clocks with a wired connection.
9. Pace clock shall be capable of performing 15 training modes:
 - a. Lap counter.
 - b. Simple pace clock
 - c. Pace clock with cumulative splits.
 - d. Pace clock with lap splits
 - e. Relay exchanges.
 - f. Start reaction
 - g. Turn speed
 - h. Breakout time
 - i. Start reaction & breakout time
 - j. Five single-lane timing modes
 - k. Mid-race timing
10. Product
 - a. Model PC-PRO - Pace Clock
 - 1) Quantity: One.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify surfaces are clean, smooth, and without voids or irregularities.

3.2 INSTALLATION - ACCESSORIES

- A. Install pool accessories and fittings in accordance with component manufacturer's instructions.

END OF SECTION