PROJECT MANUAL

Essex Townhouses
Fire Damage Repair & Exterior Improvements
1134 Quinnipiac Avenue, New Haven, CT
HANH Project: PM-24-IFB-944

BOARD OF COMMISSIONERS

William Kilpatrick, Chairman
Dr. Danya Keene, Vice Chair
Kevin Alvarez, Commissioner
Elmer Rivera Bello, Commissioner
Alberta Witherspoon, Resident Commissioner

Prepared By:

Christopher Williams Architects, LLC
85 Willow Street Building 54
New Haven, CT 06511

Issued for Bidding
July 22, 2024

TABLE OF CONTENTS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

DIVISION 08 – OPENINGS

DIVISION 09 – FINISHES

DIVISION 12 – FURNISHINGS

APPENDIX A – SAMPLE DOCUMENTS

APPENDIX B – NOISE CONTROL

END OF TABLE OF CONTENTS

LIST OF DRAWINGS

GENERAL

ABATEMENT

ARCHITECTURAL

MECHANICAL/ELECTRICAL/PLUMBING

END OF LIST OF DRAWINGS

SECTION 01 1000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
1. Designated Subcontractors.
2. Access to site.
3. Coordination with occupants.
4. Work restrictions.
5. Specification and drawing conventions.
6. Miscellaneous provisions.

B. Related Requirements:

1. Section 01 5000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Essex Townhouses Fire Damage & Exterior Improvements

1. Project Location: 1134 Quinnipiac Avenue, New Haven, Connecticut

B. Owner: Housing Authority of New Haven
360 Orange Street
New Haven, CT 06511

C. Housing Authority Project Manager: Issac Kelley
Elm City Communities, the Housing Authority of New Haven
360 Orange Street
New Haven, CT 06511
(203) 498 8800 x 1036
ikelley@elmcitycommunities.org

D. Housing Authority Building Manager: Monica Wolfork
(203) 498-8800 ext. 1131
(203) 203-410-9330
mwolfork@elmcitycommunities.org

E. Architect: Christopher Williams Architects LLC
Contact: Christopher Williams
85 Willow Street
New Haven, Connecticut 06511
(203) 776 0184
cwilliams@cwarchitectsllc.com

F. Owners Consultants: The owner has retained the following design professionals who will inspect and test the air quality of the building during construction and upon completion.:

EnviroMed Services
Contact: John Luby
470 Murdock Avenue
Meriden CT 06450
(203) 238-4846

G. Authorities Having Jurisdiction:

New Haven Fire Marshal
952 Grand Ave
New Haven, CT 06511
(203) 946-6300

New Haven Building Department
200 Orange St
New Haven, CT 06510
(203) 946-8045

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Unit 28 & 29 Fire Damage Repairs
    a. Removal and replacement of fire damaged framing and sheathing.
    b. Replacement of damaged roofing and siding.
    c. Interior doors, frames and hardware.
    d. Window replacement.
    e. Interior finishes.
    f. Hydronic heating repairs.
    g. Electrical work.
2. Basement Hatchway Replacement & Repairs
3. Building E Exterior Deck Replacements

B. Type of Contract: Project will be constructed under a single prime contract.

C. Duration of Construction period: 120 days from issuance of the Notice to Proceed (NTP) to substantial completion.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to work in areas as the work progresses. Do not disturb portions of Project site beyond areas in which to be worked on in coordination with the Owner.

1. Driveways, Walkways and Entrances: Keep driveway, parking areas, paved areas and entrances serving premises clear and available to Owner, Owner's employees, tenants and emergency vehicles at all times. Do not use these areas for parking or storage of materials except for the designated parking space directly adjacent to the Unit.

    a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

    a. The building must always be secure, during working and non-working hours.

1.6 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 9:00 a.m. to 4:30 p.m., Monday through Friday, unless otherwise indicated.

C. Existing Utility Interruptions: Do not interrupt utilities serving the adjacent unit or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than 5 days in advance of proposed utility interruptions.

2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

F. Employee Identification: Will be issued by Owner. Always require personnel to use identification tags.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

END OF SECTION 01 1000

SECTION 01 2000 – ALTERNATES, ALLOWANCES AND UNIT PRICES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Section includes administrative and procedural requirements governing Alternates, Allowances, and Unit Prices.

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

1.2 DEFINITIONS

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

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to-or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1. Procedures: Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
    a. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
    b. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
    c. Execute accepted alternates under the same conditions as other work of the Contract.
    d. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

B. ALLOWANCE – A fixed amount declared in the bidding documents for certain work, or to purchase material.

1. Where the amount of the Allowance is intended to compensate the performance of certain work, the contractor shall provide itemized documentation of:

   a. Time and material costs based on rules of measurement stipulated in the description of the Allowance or if none are specified, conventions of the primary trade performing the installation.
   b. General conditions, general requirements, and fee specifically attributable to the work of the subject Allowance.
   c. The cost presentation shall be tabulated to demonstrate that general conditions, general requirements and fee are not double-counted in the cumulative billing

2. Where the amount of the Allowance is indicated to compensate the purchase of materials, equipment or products, the base bid amount shall include the accessory costs of fully incorporating and integrating the Allowance item into the Work as a complete functioning installation, including.

   a. Receiving, unpacking, preparing, installing, testing and warranting the Allowance item.
   b. Providing concealed structural support.
   c. Providing suitable feeds and drains for mechanical plumbing or electrical services.
   d. Providing suitable and customary disconnects, isolation valves and incidental hardware not provided with the Allowance item.

C. UNIT PRICES: Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1. Items requiring Unit Prices, are listed on the Schedule of Unit Prices below and on the Bid Form.

2. Procedures:

   a. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

   b. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

   c. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price

1.3 SUBMITTALS

A. Requirements for Product Data and Samples are typically stipulated in the Sections specifying the work of Alternates, Allowances, and Unit Prices. Additional requirements may be noted in the schedule listing Alternates, and Unit Prices.

PART 2 - PRODUCTS

2.1 ALTERNATES (not used)

2.2 ALLOWANCES (not used)

2.3 UNIT PRICES

A. UNIT PRICE #1: Replacement of damaged framing in excess of the framing replacement included in the base bid. Provide a cost per board foot.

1. Cost per board foot: $_____.

B. UNIT PRICE #2: Replacement of damaged plywood roof decking or exterior sheathing in excess of the plywood replaced included in the base bid. Provide a cost per square foot, minimum 2'x4', includes removal of damaged plywood. Remove and replace a minimum size to span at least two rafter bays (supported by 3 rafters) x a minimum of 2 feet wide.

1. Cost per square foot: $_____.

C. UNIT PRICE #3: Replacement of gypsum board in excess of the gypsum board wall replacement included in the base bid.

1. Cost per square foot: $_____.

D. UNIT PRICE #4: Replacement of gypsum board in excess of the gypsum ceiling replacement included in the base bid.

1. Cost per square foot: $_____.

E. UNIT PRICE #5: Replacement of fire rated type X gypsum board in 2 layers in excess of the gypsum ceiling replacement included in the base bid.

1. Cost per square foot: $_____.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all work of Allowances, Alternates and Unit Prices consistent with best trade practice and the relevant material specification sections.

B. Where items of Work are added to the scope include fitting and adjustments necessary to accommodate adjacent surfaces and assemblies.

C. Where items of Work are removed from the scope provide suitable returns, closures, and continuity of adjacent finishes.

D. The Contractor and Architect shall at the commencement of construction as soon as possible after tenant have vacated, inspect as a team to determine the exact quantity and condition of all items included in the Schedule of Unit Prices. The final count shall be documented and become the basis of a Change order to reflect additions and deducts based on the unit prices stipulated herein.

END OF SECTION 01 2000

SECTION 01 2600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time,

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or 7 days, when not otherwise specified after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity

duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, Sample copies are included in Project Manual

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use [CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, Sample copy is included in Project Manual

C. Required Forms: Proposal Requests shall be prepared by the Contractor using the following documents. Sample documents are included in Appendix A

1. Contractor’s Change Order Proposal
2. Change Order Equipment Expense Proposal
3. Change Order Labor Worksheet
4. Change Order Material Worksheet

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

SECTION 01 2900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Section 01 2600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Section 01 3200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with continuation sheets.
    b. Submittal schedule.
    c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

    a. Project name and location.
    b. Name of Architect.
    c. Architect's project number.
    d. Contractor's name and address.
    e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.
    e. Name of supplier.
    f. Change Orders (numbers) that affect value.
    g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

        1) Labor.
        2) Materials.
        3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Architect by the 14th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

    1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

    1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
    2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

G. Transmittal: Submit one signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. Include waivers of lien and similar attachments if required.

1. Transmit with a transmittal form listing attachments and recording appropriate information about application.

H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. For Progress Payments use the following forms (sample forms included in Appendix A)

    a. Unconditional Waiver and Release Upon Progress Payment
    b. Conditional Waiver and Release Upon Progress Payment

2. For Final Payment Application use the following forms (sample forms included in Appendix A)

    a. Unconditional Waiver and Release Upon Final Payment
    b. Conditional Waiver and Release Upon Final Payment

3. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

4. When an application shows completion of an item, submit conditional final or full waivers.
5. Owner reserves the right to designate which entities involved in the Work must submit waivers.
6. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
7. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Sustainable design submittal for project materials cost data.
4. Contractor's construction schedule (preliminary if not final).
5. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

J. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

K. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.

4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2900

SECTION 01 3200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Special reports.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.

B. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

D. Construction Schedule Updating Reports: Submit with Applications for Payment.

E. Daily Construction Reports: Submit at monthly intervals.

F. Material Location Reports: Submit at monthly intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement

of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly> intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

END OF SECTION 01 3200

SECTION 01 3233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Periodic construction photographs:

1.3 INFORMATIONAL SUBMITTALS

A. Digital Photographs: Submit image files within three days of taking photographs.

1. Digital Camera: Minimum sensor resolution of 24 megapixels.
2. Identification: Provide the following information with each image description in file metadata tag:

    a. Name of Project.
    b. Name and contact information for photographer.
    c. Name of Architect.
    d. Name of Contractor.
    e. Date photograph was taken.
    f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    g. Unique sequential identifier keyed to accompanying key plan.

B. Submit digital images to Architect via an FTP site. At completion of project deliver photographs to architect on a USB flash drive as part of the closeout documents.

1.4 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 24 megapixels, and at an image resolution of not less than 6,000 x 4,000 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: A professional photographer or employee qualified to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.

D. Periodic Construction Photographs: Take as many photographs weekly as required to document pertinent existing conditions and completed work, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

END OF SECTION 01 3233

SECTION 01 3300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Section 01 3200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
2. Section 01 7823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
3. Section 01 7839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Scheduled date for Architect's final release or approval.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

C. Paper Submittals: Do not submit paper submittals.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide Cover Sheet for all submittals. See 01 3001 “Submittal Cover Sheet” for required submittal sheet.
4. Additionally on specially prepared shop drawings provide space for Architect’s Review Stamp on each sheet.
5. Transmittal Form for Electronic Submittals: Use software-generated form acceptable to Owner, containing the following information:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Construction Manager.
    e. Name of Contractor.
    f. Name of firm or entity that prepared submittal.
    g. Names of subcontractor, manufacturer, and supplier.
    h. Category and type of submittal.
    i. Submittal purpose and description.
    j. Specification Section number and title.
    k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    l. Drawing number and detail references, as appropriate.
    m. Location(s) where product is to be installed, as appropriate.
    n. Related physical samples submitted directly.
    o. Indication of full or partial submittal.
    p. Transmittal number
    q. Submittal and transmittal distribution record.
    r. Other necessary identification.
    s. Remarks.

6. Metadata: Include the following information as keywords in the electronic submittal file metadata:

    a. Project name.
    b. Number and title of appropriate Specification Section.
    c. Manufacturer name.
    d. Product name.

E. Options: Identify options requiring selection by Architect.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from

requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's] action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files.

a. Architect] will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.

e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams showing factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.

6. Submit Product Data in the following format:PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches , but no larger than 24 by 36 inches .

3. Submit Shop Drawings in the following format: PDF electronic file.

D. Contractor's Construction Schedule: Comply with requirements specified in Section 01 3200 "Construction Progress Documentation."

E. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures."

F. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions with color green notations. Mark with approval stamp before submitting to Architect.

B. The Architect will return submittals without review that bare evidence that the Contractor has not previously reviewed submittal.

C. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 7700 "Closeout Procedures."

D. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect] will stamp each submittal with an action stamp and will mark stamp appropriately to indicate as follows:


CHRISTOPHER WILLIAMS ARCHITECTS LLC

☐ APPROVED.
☐ APPROVED AS NOTED. RESUBMIT NOT REQUIRED.
☐ APPROVED AS NOTED. RESUBMIT FOR RECORD.
☐ RETURNED FOR CORRECTION. RESUBMIT REQUIRED.
☐ REVIEW NOT APPLICABLE.

Architect's review is for conformance with the general design concept and for general arrangement only. Review shall not be construed to mean that the architect accepts the detail calculations and dimensions shown in the shop drawings, or a deviation from the requirements of the contract documents. Contractor is responsible for errors or omissions in the shop drawings; for meeting all requirements of the documents; for confirming and correlating job site dimensions; for information that pertains solely to fabrication processes or techniques of construction; and for the coordination of the work of all trades.

PROJECT # _____ SUBMITTAL # _____

PROJECT _____ CSI DIVISION # _____

DATE _____ REVIEWED BY _____

85 Willow Street New Haven, CT 06511 203 776 0184 cwarchitectsllc.com

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 3300

Essex Townhouses

Fire Damage & Exterior Improvements

SUBMITTAL COVER PAGE

SUBMITTED BY: _____

SUBCONTRACTOR COMPANY NAME

SPECIFICATION SECTION: _____

Submittal Type (Product Data/ Test Data/ Shop Drawings/ Samples/ Closeout/ Etc.)	**Resubmittal?** Y/N	**Submittal Description** (Please be detailed)	**Notes/ Comments**

Contractor's Received Stamp	Consultant's Received Stamp	Architect's Received Stamp
Contractor's Review Stamp	Consultant's Review Stamp	Architect's Review Stamp

The undersigned submits this package and certifies that:

1. Submittal has been reviewed and it is complete to the best of our knowledge and confirms with requirements of Contract Documents except as noted.
2. Required dimensions will be. Have been field verified and are acceptable for installation of proposed products and construction of proposed work.
3. Required quantities for products and materials covered by this submittal have been verified as correct based on current drawings, addendum and bulletins issued.
4. Fabrication processes and construction methods proposed in this submittal are acceptable for this Project and will result in a complete, functional installation.
5. Submittal has been coordinated with other submittals and work and proposed products and construction will properly interface with other construction.

Signature: _____ Date: _____

SECTION 01 3516 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes special procedures for alteration work.

1.3 COORDINATION

A. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building and site. Some work is near circulation patterns. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work Plan and execute the Work accordingly.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

B. Fire-Prevention Plan: Submit 15 days before work begins.

1.5 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.

1. Comply with requirements specified in Section 01 3233 "Photographic Documentation."

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
3. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
4. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
5. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection .

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.

1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

C. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 01 3516

SECTION 01 5000 – TEMPORARY FACILITES

PART 1 - GENERAL

1.1 TEMPORARY FACILITIES

A. Power: The Owner's existing 110-volt convenience outlets are available for the Contractors' use. Cooperate with the Owner to identify circuits for construction activities. Verify grounding requirements. Verify that the capacity of the circuit will sustain the anticipated tool loads. Do not overload single outlets with multiple outlet taps. Use multiple circuits or local over current devices.

B. Lighting: Provide artificial lighting for construction operations when natural or ambient light is not adequate for work. Light values shall be adequate for the task in progress. Maintain required illumination levels during critical procedures and installations. Provide supplemental light at hazards

1. Existing and permanent lighting may be used during construction. Maintain lighting and make routine repairs. Prior to Substantial Completion, replace lamps with those of specified configuration, voltage and color characteristics.

C. Heating and Cooling: Provide temporary heat and cooling to maintain environmental conditions appropriate to the phase of the Work. When existing heating plant is out of service, or unable to maintain specified minimum conditions, provide auxiliary heat. Heating and cooling shall be adequate for the installation of materials, and the protection of materials and finishes from damage due to temperature or humidity.

1. Use only approved equipment listed specifically for application as an indoor appliance.
2. Do not use devices that produce open flame or smoke. Do not store fuels indoors or adjacent to occupied buildings. Maintain limited quantities of fuel. Store in listed, approved containers.
3. Hold required minimum temperatures continuously until next construction phase. Pay all costs of installation, maintenance, operation, removal and for fuel consumed.
4. Do not operate permanent equipment or facilities for temporary purposes without prior approval. Verify that installation is approved for operation, and that filters are in place. Provide and pay for operation, maintenance, and fuel consumed. The warranty date shall reflect the date of final acceptance rather than the "in service" date.

D. Ventilation: Provide ventilation of enclosed areas to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases. Avoid discharging contaminated air too near air intakes of this or adjacent buildings.

E. Telephone: Arrange for telephone service for normal business operations are beyond the range of cell phone transmissions. The Owner will designate one of its lines for emergency calls.

F. Water: Water will be made available by the Owner, at no expense to the Contractor from existing outlets at the pressure available. Make connections to existing facilities using back-flow protection. Extend branch piping with outlets located so that water is available by use of hoses. Take measures to conserve water.

1. Where water cannot be obtained at sufficient volume or pressure through available domestic hose-bibs, provide dedicated water service for construction operations. Obtain hydrant permit and meter. Extend branch piping with outlets located so that water is available by use of hoses. Pay all costs for installation, maintenance, removal, and service charges for water used.

1.2 CONSTRUCTION FACILITIES

A. Sheds: Storage sheds for tools, materials, and equipment shall be weather-tight, with heat and ventilation for Products requiring controlled conditions. Sheds shall have adequate space for organized storage and access, and lighting for inspection of stored materials.

B. Sanitary Facilities: Provide and maintain required sanitary facilities and enclosures in compliance with Applicable Laws. Construction personnel shall not use existing facilities.

1. Designated existing facilities may be used during construction operations. Provide tissue, towels and soap. Maintain in sanitary and working condition.

1.3 CONSTRUCTION AIDS

A. Provide construction aids such as scaffolds, staging, ladders, ramps, runways, platforms, railings, cranes, chutes and other such facilities and equipment required by personnel, and to facilitate execution of the Work.

B. Provide lifting devices and qualified operators necessary for the safe and efficient movement of materials. Provide guys, bracing, and support independent of the building unless specifically reviewed and approved. Do not allow employees to ride hoists or material elevators that comply with requirements for materials only. Selection of type, size, and number of facilities for temporary use at project site is Contractor's option unless otherwise indicated.

C. Designated elevators and stairways in existing building as indicated on the drawings may be used for construction personnel. Provide protective coverings for finish surfaces.

1.4 VEHICULAR ACCESS AND PARKING

A. The Owner will designate existing roads for access to the Project Site. At the preconstruction conference, discuss vehicular access requirements. Repair damage caused by construction equipment. Post signs or other warning devices where hazards may create poor visibility or new traffic patterns

1. Parking for employees of the Contractor and Subcontractors of any tier shall be limited to areas in the Contractor’s approved logistics plan. Parking will not be allowed on any other portion of the Owner's premises.

B. Abbreviations and Names: Acronyms or name abbreviations used in the Specifications or other Contract Documents shall mean the industry recognized name of trade associations, standards generating organization, governing authority or other entity applicable to context of text provision. Refer to "Encyclopedia of Associations", published by Gale Research Company, available in most public libraries.

1.5 TEMPORARY BARRIERS AND ENCLOSURES

A. Prior to the pre-construction conference, photograph existing conditions at the Project Site and surrounding area. Note pre-existing damage to areas adjacent to Project Site and areas that must be traversed to access the Work. Review existing conditions as well as proposed methods of temporary protection at pre-construction conference.

B. Provide barriers required to prevent public access to construction areas, to provide for Owner's use of the Project Site, and to protect existing facilities and adjacent properties from damage from construction operations. Where barriers or enclosures face Owner occupied areas, paint as directed by the Owner.

1. Maintain egress routes from Owner's operations. Where barriers are required along exit routes, construct to match fire rating of nearest fire separation assembly. If rating is not clear, conform to the requirements of a one-hour assembly: one layer of 5/8" type-X gypsum board attached to each side of wood or metal studs extending from the floor, tight to the bottom of the floor structure above. Tape joints and seal perimeter. When attaching partitions, use protective pads at finishes or surfaces designated to remain. Use fasteners that will permit repairs to the contact surface. Repairs shall be indistinguishable from existing surface. Do not use powder driven fasteners unless approved on a case-by-case basis.
2. Where acoustical separation is required, barrier shall conform to the requirements of a one-hour assembly.

C. Provide temporary, weather-tight closures where reasonably required to ensure adequate workmanship and protection from weather. Construct closures to maintain conditions for work, to allow for temporary heating, and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.

D. Protect existing surfaces and finishes designated to remain. Provide covers, pads, and draping to resist Work-related abuse. Tape or seal edges to exclude fugitive dust and

grit. Restrain cover materials that may scrub or abrade finishes. Restore finishes which have been damaged or made unsightly.

E. Provide eight (8) foot high fence around the Project Site. Equip with vehicular and pedestrian gates with locks. Arrange locks on one personnel gate to accommodate Owner's padlock, and padlocks of other trades requiring after-hour access. Use commercial grade chain link fence or painted plywood. Do not use barbed wire or razor ribbon without specific approval.

F. Provide barricades and covered walkways required for public rights-of-way and for public access to existing building. Where a public roadway/walkway adjoins Project Site in a manner that involves possibility that materials might be hoisted from roadway, across walkway and onto site, erect a substantial and structurally adequate protective bridge for passage of persons along walkway. Provide heavy scaffolding, waterproof heavy wood-plank type overhead deck, protective plywood enclosure walls, hand rails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions needed for adequate protection and safe passage. Maintain facility in a manner acceptable to Owner. Coordinate bridge with entrance gates and other facilities and obstructions.

G. Identify and protect existing utilities. Confer with respective utility company when overhead lines or exposed connections are within potential contact area of construction activities. When excavation is required, see "*Call before You Dig*" requirements in Section 01 7000.

H. Provide protection for landscape and grounds within and adjacent to Project Site.

1. Protect walkways and curbs where vehicles are expected to cross or park. Use planking or sheet materials to evenly distribute loads from wheels and stabilizers. Take measures to prevent staining or chipping. Restore paving where damaged or made unsightly by construction activities.
2. Control water and site drainage. When altering discharge or drainage patterns, provide positive means of directing water to prevent nuisance as well as hazardous conditions.
3. Do not permit effluent produced as a result of construction activities to drain onto plantings, landscape features or into storm drains.
4. Protect trees, shrubs and plantings according to the likely hazard. In general, box tree trunks with framing lumber and plywood. Construct a "roof" or "tent" over trees or plantings to prevent damage from above. Provide canvas or poly covers to protect from over-spray. Prop-up or tie back branches that may interfere with construction activities. Proposed protection techniques shall be submitted for review. Proceed only according to accepted methods. If protection requirements are not clear, confer with the Owner and proceed as directed.

    a. Certain specimen trees may require boxing at or beyond the drip line. Confirm requirements at preconstruction conference.
    b. Do not use trees as construction aids. Do not restrain temporary braces or guy against trees. Pile material well beyond drip lines.

5. Avoid using lawns for parking, material storage, stockpiling debris, or discharging waste liquids. Restore lawn areas damaged by construction activities.

    a. Replace contaminated soils.
    b. Regrade to original contour.
    c. Seed or sod to match adjacent undamaged area.
    d. Heal in plantings removed during construction as soon as feasible.

I. Protect installed Work from damage caused by construction operations. Limit traffic on finished surfaces. Carefully follow manufacturers' instructions and specified directives for curing periods, and post installation environmental conditions:

1. Where Work occurs in multiple phases or locations, provide means of protecting unfinished and newly finished Work from construction and pedestrian abuse. Protect pedestrians and construction personnel from local hazards due to raw edges and unfinished work.

1.6 SECURITY MEASURES

A. Project security shall be reviewed at the pre-construction conference.

B. Comply with the Owner' basic security requirements:

1. The Contractor shall specifically designate an individual who shall be responsible for distributing and collecting keys to limited access areas each day. Maintain a log of key distribution.
2. Advise Subcontractors' forces on-site of appropriate standards of conduct. Persistent use of profanity or comments directed at individuals outside the work force may be interpreted as harassment or disorderly conduct by Campus Police.
3. Provide a roster of all Subcontractors' personnel on site. Issue identification badges. Display badges prominently when on site. Collect and return badges with application for final payment.

C. At pre-construction conference, the Project Manager will cooperate in identifying areas available for material and tool storage. These areas will be incorporated into the Project Site, and secured by the Contractor.

D. Provide effective means of securing or disabling ladders, scaffold, staging or hoists where they may provide unauthorized access to the Owner’s facilities.

E. Disable or remove material handling equipment.

F. Maintain perimeter security. When it becomes necessary to prop open gates or doors that are normally locked, provide continuous supervision of area until doors or gates can be closed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 5000

SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

    a. Form of Approval: As specified in Section 01 3300 "Submittal Procedures."
    b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 3300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site..
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store products that are subject to damage by the elements with the structure.
3. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
4. Protect stored products from damage and liquids from freezing.
5. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 7700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:

    a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
    b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
    b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

SECTION 01 7300 – EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.

B. Related Requirements:

1. Section 01 1000 "Summary" for limits on use of Project site.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 1000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
5. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Walls and Ceilings: Fill abandoned holes flush with appropriate patching material, paint effected area with paint matching color and sheen exactly so that repair will not be visible.

4. Floors, Fill abandoned holes flush with appropriate patching material, paint patch to match color or adjacent flooring.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 7300

SECTION 01 7329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. This Section includes procedural requirements for cutting and patching.

1.3 RELATED SECTIONS

A. Refer to Divisions 3 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 22, 23 and 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.4 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.5 SUBMITTALS

A. Cutting and Patching: Submit a method describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.

2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.

3. Products: List products to be used and firms or entities that will perform the Work.

4. Dates: Indicate when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.

6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's Approval: Obtain approval of cutting and patching before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.6 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

1. Provide a list of additional elements that are structural elements and that require Architect's or Construction Manager's approval of a cutting and patching proposal.

B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.

2. Air or smoke barriers.

3. Fire-protection systems.

4. Control systems.

5. Communication systems.

6. Conveying systems.

7. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers.

2. Membranes and flashings.

3. Exterior construction.

4. Equipment supports.

5. Piping, ductwork, vessels, and equipment.

6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.7 WARRANTY

A. Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. In-Place Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. In-Place Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.

5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01 7329

SECTION 01 7700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

1.3 ACTION SUBMITTALS

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services

and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Complete startup and testing of systems and equipment.
2. Perform preventive maintenance on equipment used prior to Substantial Completion.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
4. Complete final cleaning requirements.
5. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 01 2900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list),

endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.
5. Submit final completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 INCOMPLETE ITEMS

A. It is the intent of the project that substantial and final completion occur at the same time.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 7300 "Execution Requirements”

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 01 7700

SECTION 01 7823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

A. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

    a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    b. Enable inserted reviewer comments on draft submittals.

B. Submit printed manual in final form prior to requesting inspection for Substantial Completion and at least 7 days before commencing demonstration and training. Architect will return copy with comments.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready

access to desired information. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
2. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
3. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.

2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.

4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from

the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

G. Comply with Section 01 7700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 7823

SECTION 01 7839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Requirements:

1. Section 01 7700 "Closeout Procedures" for general closeout procedures.
2. Section 01 7823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up record prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Mark important additional information that was either shown schematically or omitted from original Drawings.
5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

B. Format: Submit record Product Data as annotated PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 7839

SECTION 02 0900 - DUST CONTROL

PART 1 - GENERAL

A. EXISTING CONDITIONS

1. General: Prevent dust migration outside of the project limit. The term "dust migration" shall include air-borne particulates that are the uncontrolled products of construction operations as well as materials large enough to be ground into particulates and dispersed with foot traffic.
2. The contractors involved with this project shall utilize localized ventilation equipment and wet methods when disturbing wall, floor and ceiling areas. The barriers and negative air ventilation shall remain in place during all phases of the work to prevent dust migration from work areas to those areas occupied by the Owner or completed and pending occupancy.
3. Materials and Equipment: The work of this Section, without limiting the generality thereof, includes the furnishing of labor, materials, tools, equipment, services and incidentals necessary to safely accomplish tasks which will disturb lead containing paint.
4. Approvals and Inspections: Temporary facilities, work procedures, equipment, materials, services, and agreements must fully comply with EPA, OSHA, and NIOSH recommendations, standards and guidelines, as well as any other applicable federal, state, and local regulations. Where there exists an overlap of these regulations and guidelines, the most stringent shall apply.
5. Disposal: The Contractor shall dispose of the scraped paint and debris in accordance with the Resource Conservation and Recovery Act. Painted wastes shall be deposited by the contractor in containers supplied by the Owner. The contractor shall store the containers in a location designated by the Owner. The General Contractor in consultation with the Owner shall be responsible to properly characterize the waste by the EPA Toxicity Characteristic Leaching Procedures prior to disposal.

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION

A. WORK AREA SET UP

1. Site Safety: The Contractor is solely responsible for all safety at the work site.

2. Access to Work Areas: It will be the Contractor's responsibility to allow only authorized personnel into the work area. For locations in which Owner occupied areas about the work area, dust control partitions shall be erected to isolate interior spaces by erection of single layer utilizing 6-mil poly sheeting. The barriers shall be large enough to access all areas that are scheduled to have dust generating activities conducted.

B. CLEAN-UP PROCEDURES

1. When work is in progress, the work site shall be cleaned at end of each day's activities. Dry sweeping shall be prohibited; wet sweeping and or hepa-vacuums shall be required for clean-up operations.

2. Equipment shall be cleaned by HEPA vacuuming. Surfaces shall be maintained as free as practicable of accumulations of lead containing dust and debris. Clean-up of dust and debris shall be accomplished with a HEPA vacuum or wet methods. The debris shall be misted with water with an airless type sprayer and collected with a mop or broom.

C. DISPOSAL OF WASTE MATERIAL

1. General: The Contractor shall consult with the Owner to determine disposal requirements for construction and demolition debris that contains lead containing paint coated debris. The requirements of the Resource Conservation and Recovery Act (RCRA) shall be complied with as well as applicable state solid waste plan requirements.

2. Storage Requirements: Any item found to be hazardous by way of testing shall be kept in a secured area or lockable container that is inaccessible to all persons other than abatement personnel. All hazardous waste shall be labeled *"Hazardous Waste"*, and include the date that the Contractor began to collect waste in that container. Hazardous and non-hazardous waste shall be kept in totally and completely separate containers.

3. Disposal Packaging: Any hazardous or potentially hazardous waste shall be stored in US Department of Transportation (DOT) approved containers and properly labeled and stored in a secure manner.

4. Waste Manifests: The Owner shall be responsible for the preparation of any manifests necessary for the disposal of project-related hazardous wastes. The Owner will only sign a manifest or manifests for project-related hazardous wastes; defined as those wastes present at the site at project initiation.

END OF SECTION 02 0900

SECTION 02 4119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

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

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability

of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

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

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

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

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

D. Predemolition Photographs or Video: Submit before Work begins.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

F. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.7 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is bound in this Project Manual for review and use. Examine report to become aware of locations where hazardous materials are present.

E. Storage or sale of removed items or materials on-site is not permitted.

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

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

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

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

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

1. Comply with requirements specified in Section 01 3233 "Photographic Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

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

1. Comply with requirements for existing services/systems interruptions specified in Section 01 1000 "Summary."

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

1. Project Manager will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be

removed and cap or plug remaining piping with same or compatible piping material.

b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

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

1. Comply with requirements for access and protection specified in Section 01 5000 "Temporary Facilities and Controls."

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

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 5000 "Temporary Facilities and Controls."

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

or uncontrolled movement or collapse of construction being demolished.

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

3.4 SELECTIVE DEMOLITION, GENERAL

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

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

C. Removed and Salvaged Items:

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

D. Removed and Reinstalled Items:

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

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

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

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

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

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

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

3.6 DISPOSAL OF DEMOLISHED MATERIALS

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

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.7 CLEANING

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

END OF SECTION 02 4119

SECTION 02 8216 - ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 SCOPE

A. The work specified herein shall be the abatement of asbestos-containing materials by persons who are knowledgeable, qualified, and trained in the removal, treatment, handling, and disposal of asbestos-containing material, and the subsequent cleaning of the affected environment. The Contractor shall have a Competent Person in control on the job site at all times during asbestos abatement work. This person must comply with applicable Federal, State and Local regulations which mandate work practices, and be capable of performing the work of this contract.

B. The Contractor shall be licensed by the State of Connecticut in accordance with State of Connecticut Regulations, Sections 20-440-1 through 9 & 20-441. The asbestos supervisor and workers shall be licensed by the State of Connecticut in accordance with State of Connecticut Regulations, Sections 20-437 and 20-438. Should any portion of the work be subcontracted, the subcontractor must also be licensed in accordance with these regulations. The licensing requirements are available from the Environmental Health Services Division, Department of Public Health, 410 Capitol Avenue, MS#51AIR, P.O. Box 340308, Hartford, CT 06134.

C. Housing Authority New Haven (Owner) will retain the services of a Project Monitor for protection of its interests and those using the building. Pre-abatement, during abatement and post-abatement sampling will be conducted as deemed necessary.

D. Deviations from this Specification require the written approval of Housing Authority New Haven

E. The Contractor is responsible for restoring all work areas and auxiliary areas utilized during abatement to conditions equal to or better than original. Any damage caused during the performance of abatement activities shall be repaired by the Contractor (e.g., paint peeled off by barrier tape, nail holes, water damage, removal of ceiling tiles or concrete blocks, broken glass, etc.) at no additional expense to the Owner. The Contractor is responsible for protecting all objects in work areas that are permanent fixtures or too large to remove.

F. The Contractor shall be responsible for the following general requirements:

1. Obtain all approvals and permits, and submit all notifications required.
2. Provide, erect, and maintain all planking, bracing, shoring, barricades, and warning signs.
3. Unless otherwise specified, all equipment, fixtures, piping and debris resulting from demolition shall become the property of the Contractor and shall be removed from the premises.
4. Materials to be reused shall be removed with the utmost care to prevent damage of any kind. All material to be reused shall be stored as directed. The Contractor shall coordinate with the Owner as to the storage location.
5. Materials not scheduled for reuse shall be removed from the site and disposed of in accordance with all applicable Federal, State and Local requirements.

G. It shall be the responsibility of the Contractor to protect and preserve in operating condition, all utilities traversing the building and site. Damage to any utility due to work under this Contract shall be repaired to the satisfaction of the Owner at no cost to the Owner.

1.2 DESCRIPTION OF WORK

A. The Contractor shall supply all labor, materials, equipment, services, insurance (with specific coverage for work on asbestos), and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations and these specifications.

B. The asbestos abatement work shall include the removal of asbestos-containing materials (ACM) as shown on the drawings and specified herein.

Essex Townhouses – Drawings H101-H103

Asbestos abatement work includes the removal of wallboard with asbestos-containing joint compound under negative pressure containment from fire-damaged Units 28 & 29 and from the carports in Units 15-24 at Essex Townhouses as depicted on Drawings H101-H103 and as specified herein

1.3 DEFINITIONS

Adequately Wet - Sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.

AHERA - Asbestos Hazard Emergency Response Act - U. S. EPA regulation 40 CFR Part 763 under Section 203 of Title II of the Toxic Substances Control Act (TSCA), 15 U.S.C. 2643. This rule mandates inspections, accreditations of persons involved with asbestos, and final air clearances following abatement in public and private schools, and public and commercial buildings.

Alternative Work Practice (AWP) - Deviation from Asbestos Standards (Sections 19a-332a-1 to 19a-332a-16 inclusive). Deviation requires a written approval letter from the State of Connecticut Department of Public Health and the Owner.

Asbestos - The term asbestos includes chrysotile, amosite, crocidolite, asbestiform tremolite, asbestos, anthophyllite asbestos, actinolite asbestos and any of these minerals that has been chemically treated and/or altered.

Asbestos Abatement - The removal, encapsulation, enclosure, renovation, repair, demolition or other disturbance of asbestos-containing materials except activities which are related to the removal or repair of asbestos cement pipe and are performed as defined in Section 25-32a of the Connecticut General Statutes.

Asbestos-Containing Material (ACM) - Any material containing more than one percent asbestos.

Asbestos-Containing Waste Materials - Mill tailings or any waste that contains commercial asbestos and is generated by a source subject to the provisions of this subpart. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovations operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.

Asbestos Control Area - An area where asbestos abatement operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris. Two examples of an Asbestos Control Area are a "full containment" and a "glove-bag."

Asbestos Fiber - A particulate form of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals having a length of five micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

Authorized Asbestos Disposal Facility - A location approved by the Connecticut Department of Environmental Protection for handling and disposing of asbestos waste or by an equivalent regulatory agency if the material is disposed of outside the State of Connecticut.

Category I Non-Friable Asbestos-Containing Material (ACM) -Asbestos-containing packings, gaskets, resilient floor coverings and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in Appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.

Category II Non-Friable ACM - Any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the method specified in Appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Competent Person - Individual capable of identifying existing asbestos, tremolite, anthophyllite, or actinolite hazards and corrective measures to eliminate them, as specified in 29 CFR 1926.32. The duties of the Competent Person include at least the following: establishing the pressure differential, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate personal protective equipment, are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified; and ensuring that engineering controls in use are in proper operating condition and are functioning properly.

Concealed Space - Space which is out of sight. Examples of a concealed space include area above ceilings; below floors; between double walls; furred-in areas; pipe and duct shafts; and similar spaces.

Critical Barrier - A minimum of two layers of six (6) mil polyethylene sheeting taped securely over windows, doorways, diffusers, grilles and any other openings between the Work Area and uncontaminated areas outside of the Work Area, including the outside of the building.

Decontamination Enclosure System - A series of rooms separated from the Work Area and from each other by air locks, for the decontamination of workers and equipment.

Demolition - The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

DEEP - The Connecticut Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT 06106.

DPH - The Connecticut Department of Public Health, 410 Capitol Avenue, MS#51AIR, P.O. Box 340308, Hartford, CT 06134.

Differential Pressure - A difference in the static air pressure between the Work Area and occupied areas, and is developed by the use of HEPA filtered exhaust fans. This differential is generally in the range of 0.02 to 0.04 inches of water column.

Encapsulant - Specific materials in various forms used to chemically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulant as follows:

a) Removal Encapsulant (can be used as a wetting agent).
b) Bridging Encapsulant (used to provide a tough durable surface coating to asbestos-containing material).
c) Penetrating Encapsulant (used to penetrate the asbestos containing material down to substrate, encapsulating all asbestos fibers).
d) Lock-down Encapsulant (used to seal off "lock-down" minute asbestos fibers left on surfaces from which asbestos containing materials have been removed).

Encapsulation - The application of an encapsulant to asbestos-containing building materials to control the possible release of asbestos fibers into the air.

Engineering Controls - Controls to include, but not be limited to, pressure differential equipment, decontamination enclosures, critical barriers and related procedures.

Equipment Decontamination Enclosure System - The portion of a Decontamination Enclosure System designed for controlled transfer of materials and equipment into or out of the Work Area, typically consisting of a Washroom and a Holding Area.

Exposed - Open to view.

Finished Space - Space used for habitation or occupancy where rough surfaces are plastered, paneled or otherwise treated to provide a pleasing appearance.

Fixed Critical Barrier - Barrier constructed of 2" x 4" metal framing 16" O.C., with 1/2" wallboard on the occupied side and ½” wallboard and two layers of six (6) mil polyethylene sheeting on the Work Area side to prevent unauthorized access or air flow.

Fixed Object - A piece of equipment or furniture in the Work Area which cannot be removed from the Work Area, as determined by the Owner.

Friable Asbestos Material - Material containing more than 1 percent asbestos as determined using the method specified in Appendix A, subpart F, 40 CFR part 763, Section 1, Polarized Light Microscopy, that when dry can be crumbled, pulverized or reduced to powder by hand pressure. If the asbestos content is less then 10 percent as determined

by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

Glove-Bag - A sealed compartment with attached inner gloves used for the handling of asbestos-containing materials. Properly installed and used glove bags provide a small Work Area enclosure typically used for small scale asbestos stripping operations. Information on glove-bag installation, equipment and supplies, and work practices is contained in the Occupational Safety and Health Administration's (OSHA's) final rule on occupational exposure to asbestos (29 CFR 1926.1101).

Glove-Bag Technique - A method with limited applications for removing small amounts of friable asbestos-containing material from HVAC ducts, short piping runs, valves, joints, elbows, and other non-planar surfaces in a non-contaminated work area. The glove-bag assembly is a manufactured or fabricated device consisting of a glove-bag (typically constructed of six (6) mil polyethylene or polyvinyl chloride plastic), two inward projecting long sleeves, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glove-bag is constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process.

High-efficiency particulate air (HEPA) A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles 0.3 microns in diameter.

Lock-down - The procedure of spraying polyethylene sheeting and building materials with an encapsulant type sealant to seal in non-visible asbestos-containing residue.

Movable Object - A piece of equipment or furniture in the Work Area which can be removed from the Work Area, as determined by the Owner.

Non-Friable Asbestos-containing Material - Material containing more than 1 percent asbestos as determined using the method specified in Appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy, that when dry cannot be crumbled, pulverized or reduced to powder by hand pressure.

Permissible Exposure Limit (PEL) - An airborne concentration of asbestos, tremolite, anthophyllite, actinolite or a combination of these minerals of 0.1 fibers per cubic centimeter (f/cc) of air calculated as an eight (8) hour time-weighted average, as determined by Phase Contrast Microscopy.

Personal Monitoring - Air sampling within the breathing zone of an employee.

Pre-Clean - The process of cleaning an area before asbestos abatement activities begin to ensure all dust and debris in the area considered to be asbestos-containing are properly contained and disposed of. This increases the likelihood the area will pass aggressive air sampling clearance requirements after asbestos-containing materials have been removed.

Regulated Area - Area established by the employer to demarcate areas where airborne concentrations of asbestos, tremolite, anthophyllite, actinolite or a combination of these minerals exceed, or can reasonably be expected to exceed, the Permissible Exposure Limit.

Regulated Asbestos-Containing Material (RACM) - (a) Friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II

non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting members are wrecked or taken out are demolitions.

Repair - Overhauling, rebuilding, reconstructing or reconditioning of structures or substrates where asbestos, tremolite, anthophyllite or actinolite is present.

Unfinished Space - Space used for storage, utilities or work area where appearance is not a factor. Examples of an unfinished space include crawlspace; pipe tunnel and similar spaces.

Visible Emissions - Any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos-containing waste material or from any asbestos milling, manufacturing, or fabricating operation. This does not include condensed, uncombined water vapor.

Visible Residue - Any debris or dust on surfaces in areas within the Work Area where asbestos abatement has taken place and which is visible to the unaided eye. All visible residue is assumed to contain asbestos.

Waste Generator - Any owner or operator of a source whose act or process produces asbestos-containing waste material.

Waste Shipment Record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.

Work Area - Specific area or location where the actual work is being performed or such other area of a facility which the Commissioner determines may be hazardous to public health as a result of such asbestos abatement.

Worker Decontamination Enclosure System - The portion of a Decontamination Enclosure System designed for controlled passage of workers and authorized visitors, typically consisting of a Clean Room, a Shower Room and an Equipment Room.

1.4 REFERENCES

A. The current issue of each document shall govern. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.

1. Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1001 - Asbestos, Tremolite, Anthophyllite, and Actinolite.

29 CFR 1910.134 - Respiratory Protection.

29 CFR 1926.21 - Safety Training and Education

29 CFR 1926.32 - Definitions

29 CFR 1926.51 - Sanitation

29 CFR 1910.134 - Gases, Vapors, Fumes, Dusts, and Mists

29 CFR 1926.59 - Hazard Communication.

29 CFR 1926.200 - Accident Prevention Signs and Tags.

29 CFR 1926.417 - Lockout and Tagging of Circuits.

29 CFR 1926.1101 - Asbestos

2. Environmental Protection Agency (EPA)

   40 CFR 61, Subpart M - National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Revision; Final Rule.

   40 CFR 763, Subpart E - Asbestos Hazard Emergency Response Act (AHERA).

   40 CFR 763, Subpart G - Worker Protection Rule.

3. State of Connecticut, Department of Public Health Regulations (DPH)

   Section 19a-332a-1 through 19a-332a-16 - Standards for Asbestos Abatement.

   Section 20-440-1 through 20-440-9 and 20-441 Licensure and Training.

4. American National Standards Institute (ANSI)

   ANSI Z9.2 - Fundamentals Governing the Design and Operation of Local Exhaust Systems.

   ANSI Z88.2 - Respiratory Protection.

5. American Society of Testing and Materials (ASTM)

   ASTM E 84 - Surface Burning Characteristics of Building Materials.

   ASTM E 96 - Water Vapor Transmission of Materials.

   ASTM E 119 - Fire Tests of Building and Construction Materials.

   ASTM E 736 - Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.

   ASTM E 1368 - Visual Inspection of Asbestos Abatement Projects.

   ASTM E 1494 - Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials.

6. Underwriters Laboratories, Inc. (UL)

   UL 586 - High-Efficiency, Particulate, Air Filter Units.

1.5 DOCUMENTATION

A. Submit two copies of the following documentation to ensure compliance with the applicable regulations. An up-to-date copy shall be retained at the job site at all times.

B. Manufacturer's Catalog Data:

MSDS for All Materials Delivered to the Site

C. Statements:

Connecticut Notifications
Worker Medical Certification
Worker Training Certification
Worker Respirator Fit Testing
Worker Asbestos Licenses
OSHA Laboratory Certification
Landfill Approval
Safety Plan
Respirator Protection Plan
Initial Exposure Assessment

1. Submit notification to the following agencies at least ten (10) days before work commences on the project:

   a. Department of Public Health
      Environmental Health Section
      450 Capitol Avenue, MS#51AIR
      P.O. Box 340308
      Hartford, CT 06134-0308

2. Copies of all required notifications, approvals and permits for the removal, disposal and transport asbestos-containing or contaminated materials.

3. Documentation from a physician certifying that all employees who may be exposed to airborne asbestos in excess of the background level have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health affects. In addition, document that personnel have received medical monitoring required in 29 CFR 1926.1101. They shall also be informed of the specific types of respirators the employee shall be required to wear and the work he/she will be required to perform as well as special work place conditions such as high temperature, high humidity and chemical contaminants which to which he/she may be exposed.

4. Documentation certifying that all employees have received training in the proper handling of materials that contain asbestos; understand the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis.

5. Documentation of respiratory fit testing for all employees who must enter the Work Area. This fit testing shall be in accordance with qualitative procedures as detailed in 29 CFR 1926.1101.

6. Qualifications of the person proposed for air sampling to assure workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.1101. Include the name and address of the testing laboratory proposed to

perform air sample analysis on behalf of the Contractor, along with their NIOSH PAT Program I.D. number.

7. Establish and supervise in accordance with 29 CFR 1926.21, a program for the education and training of workers in the recognition, avoidance and prevention of unsafe conditions and the regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury. Include any site specific information to address health and safety procedures unique to this project.

8. Establish a written Respiratory Protection Plan in accordance with 29 CFR 1910.134. This plan shall establish procedures governing the selection and use of respirators and shall include such information as training in the proper use of respirators; medical examination of workers to determine whether or not they may be assigned an activity where respiratory protection is required; training in proper use and limitations of respirators; respirator fit testing; regular inspection and evaluation of the continued effectiveness of the program; and other elements included in the standard.

9. Demonstrate that employees exposure will be below the PEL's. For Class I asbestos work until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PEL's, or otherwise makes a negative exposure assessment, the employer shall presume that employees are exposed in excess of the TWA and excursion limit.

D. Records:

Sign-in/out Logs
Personal Air Sampling Results
Waste Shipment Records
Pressure Differential Recording Data

1.6 PERSONNEL PROTECTION

A. Instruct workers in all aspects of personnel protection, work procedures, emergency evacuation procedures and use of equipment including procedures unique to this project.

B. Ensure workers are fully protected with respirators and protective clothing during work in the Asbestos Control Area, where there is the possibility of disturbing asbestos-containing or asbestos-contaminated materials.

C. Respiratory protection shall meet the requirements of OSHA as required in 29 CFR 1910.134 and 29 CFR 1926.1101. Provide appropriate respiratory protection for each worker and ensure usage during potential asbestos exposure. As a minimum, workers shall be equipped with powered air-purifying respirators (PAPR) with HEPA filters.

D. Select respirators from among those jointly approved as being acceptable for protection by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11. Provide an adequate supply of filter elements for respirators in use.

E. Minimum respiratory protection shall be as follows:

Airborne concentration of asbestos, tremolite, anthophyllite, actinolite or a combination of these minerals.	Required Respirator
Not in excess of 10 f/cc (100 x PEL)	1. Any powered air purifying respirator equipped with high efficiency filters. 2. Any supplied-air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1000 x PEL)	1. Full facepiece supplied supplied air respirator operated in pressure demand mode.
Greater than 100 f/cc (>1000 x PEL) or unknown concentration	1. Full facepiece supplied air respirator operated in pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus.

Note: 1. Respirators assigned for higher airborne fiber concentrations may be used at lower concentrations.

2. A high-efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.

F. Provide and require all workers to wear protective clothing in Work Areas where asbestos fiber concentrations exceed permissible limits established by OSHA. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.

G. Provide all authorized persons entering contaminated areas with proper respirators and protective clothing.

H. Ensure that all workers and authorized persons enter and leave the Asbestos Control Area through the Worker Decontamination Enclosure System.

I. Ensure all contaminated protective clothing remains in the Equipment Room for reuse or disposal of as contaminated waste.

J. Ensure workers do not eat, drink, smoke or chew gum or tobacco while in the Asbestos Control Area.

1.7 EQUIPMENT REMOVAL PROCEDURE

A. Clean surfaces of contaminated containers and equipment thoroughly by vacuuming with HEPA filtered equipment and wet wiping before moving such items into the Equipment Decontamination Enclosure System for final cleaning and removal to uncontaminated areas. Ensure that personnel do not leave the Asbestos Control Area through the Equipment Decontamination Enclosure System.

1.8 SEQUENCE OF WORK

A. Proceed in accordance with the sequence of work as mutually agreed upon with the Construction Manager. Work shall be divided into convenient Work Areas, each of which is to be completed as a separate unit.

B. The following sequence of work shall be used for the asbestos abatement work:

1. A visual inspection of the Work Area to determine pre-existing damage to facility components.
2. Release of floor area (Phase) to the Contractor.
3. All temporary utilities required for the project shall be on site and operational prior to the initiation of asbestos work.
4. Abatement of all asbestos-containing materials by the Contractor.
5. Air sampling by the Project Monitor for reoccupancy.
6. Containment tear-down and clean-up.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description. Do not use damaged or deteriorating materials. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fire retardant polyethylene sheet in roll size to minimize the frequency of joints, shall be delivered to job site with factory label indicating four (4) or six (6) mil.

B. Polyethylene disposable bags shall be six (6) mil with pre-printed label. Disposable bags shall be opaque.

C. Tape shall be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces. Tape must be capable of adhering under both dry and wet conditions.

D. Surfactant (wetting agent) shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration one (1) ounce surfactant to five (5) gallons of water or as directed by the manufacturer.

E. Containers must be impermeable and shall be both air and watertight. Containers shall be labeled in accordance with OSHA Standard 29 CFR 1926.1101 and EPA 40 CFR Part 61.152 as appropriate.

F. Labels and signs shall conform to OSHA Standard 29 CFR 1926.1101.

G. Encapsulant shall be bridging or penetrating type which has been approved by the Design Consultant. Usage shall be in accordance with manufacturer's printed technical data. Encapsulant must be compatible with new materials being installed. Encapsulant shall dry clear.

H. Glove-bag assembly shall be manufactured of six (6) mil transparent polyethylene or PVC with two (2) inward projecting long sleeve gloves, an internal pouch for tools, and an attached labeled receptacle for waste.

2.2 TOOLS AND EQUIPMENT

A. Tools and equipment shall be suitable for asbestos removal.

B. Protective clothing, respirators, filter cartridges, air filters and sample filter cassettes shall be provided in sufficient quantities for the project.

C. Electrical equipment, protective devices and power cables shall conform to all applicable codes.

D. Shower stalls and plumbing shall include sufficient hose length and drain system or an acceptable alternate. Showers shall be equipped with hot and cold or warm running water. One shower stall shall be provided for each eight workers.

E. Exhaust air filtration units shall be equipped with HEPA filters capable of providing sufficient air exhaust to create a minimum pressure differential of 0.02 inches of water column, and to allow a sufficient flow of air through the area. An automatic warning system shall be incorporated into the equipment to indicate pressure drop or unit failure. No air movement system or air filtering equipment shall discharge unfiltered air outside the Asbestos Control Area.

F. Pressure differential monitoring equipment shall be provided to ensure exhaust air filtration devices provide the minimum pressure differential required between the Work Area and occupied areas of the facility.

G. Spray equipment shall be capable of mixing wetting agent with water and capable of generating sufficient pressure and volume. Hose length shall be sufficient to reach all of the Asbestos Control Area.

H. Vacuum units, of suitable size and capabilities for the project, shall have HEPA filters capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 microns in diameter or larger.

I. Ladders and/or scaffolds shall be of adequate length, strength and sufficient quantity to support the work schedule.

J. Other materials such as lumber, nails and hardware necessary to construct and dismantle the decontamination enclosures and the barriers that isolate the Work Area shall be provided as appropriate for the work.

PART 3 EXECUTION

3.1 PREPARATION OF WORK AREA ENCLOSURE SYSTEM

A. Prior to beginning work, the Owner, Design Consultant, and Contractor shall conduct a pre-abatement meeting, perform a visual survey of each Work Area and list all pre-existing damage to building components. The Contractor shall submit to the Owner a list which shall include all damaged areas not scheduled to be repaired under this Contract and include photographs, video tapes as applicable.

B. Post warning signs meeting the specifications of OSHA 29 CFR 1910 and 29 CFR 1926.1101 at each Regulated Area. In addition, signs shall be posted at all approaches to Regulated Areas so that an employee may read the sign and take the necessary protective steps before entering the area. Additional signs may require posting following construction of work place enclosure barriers.

C. Utilize engineering controls and personnel protective equipment while installing enclosures and supports when asbestos-containing materials may be disturbed.

D. When feasible, shut down and lock out electrical power, including all receptacles and light fixtures. Protect receptacles and light fixtures remaining in the Work Area with six (6) mil polyethylene and seal with tape. Coordinate all power isolation with the Owner.

E. Provide temporary power and lighting and ensure safe installation, including ground fault protection, of temporary power sources and equipment in compliance with applicable electrical code and OSHA requirements. The Contractor is responsible for proper connection and installation of electrical wiring.

F. Shut down and isolate heating, cooling, and ventilating air systems to prevent contamination and fiber dispersal to other areas of the building. Seal all vents.

G. Pre-clean movable objects within the proposed Work Areas using HEPA filtered vacuum equipment and/or wet cleaning methods as appropriate and remove such objects from Work Areas to a temporary location.

H. Pre-clean fixed objects within the proposed Work Areas, using HEPA filtered vacuum equipment and/or wet cleaning methods as appropriate, and enclose with two layers of six (6) mil polyethylene sheeting sealed with tape.

I. Clean the proposed Work Areas using HEPA filtered vacuum equipment and/or wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

J. Seal off all windows, doorways, skylights, ducts, grilles, diffusers, and any other openings between the Work Area and the uncontaminated areas outside of the Work Area with critical barriers. Doorways and corridors which will not be used for passage during work must be sealed with fixed critical barriers.

K. Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Polyethylene shall be applied alternately to floors and walls. Cover floors first, with a layer of six (6) mil polyethylene sheeting, so that polyethylene extends at least twelve (12) inches up on walls. Cover walls with a layer of four (4) mil polyethylene sheeting to

twelve (12) inches beyond the wall floor intersection, thus overlapping the floor material by a minimum of twenty-four (24) inches. Repeat the process for the second layer of polyethylene. There shall be no seams in the plastic sheet at wall-to-floor joints.

L. Conspicuously label and maintain emergency and fire exits from the Asbestos Control Area satisfactory to fire officials.

M. No asbestos abatement prep or removal work may occur with children under age 18 in the school building or on the grounds of the school.

3.2 WORKER DECONTAMINATION ENCLOSURE SYSTEM

A. Establish contiguous to the Work Area, a Worker Decontamination Enclosure System consisting of Equipment Room, Shower Room and Clean Room in series. Access to the Work Area shall only be through this enclosure.

B. Access between rooms in the Worker Decontamination Enclosure System shall be through double flap curtained openings (air locks). Other effective designs are permissible. The Clean Room, Shower Room and Equipment Room located within the Worker Decontamination Enclosure, shall be completely sealed ensuring sole source of air flow into the Asbestos Control Area originates from the outside uncontaminated areas.

C. The Clean Room shall be adequately sized to accommodate workers and shall be equipped with a suitable number of hooks, lockers, shelves, etc., for workers to store personal articles and clothing. Changing areas of the Clean Room shall be suitably screened from areas occupied by the public.

D. The Shower Room shall be of sufficient capacity to accommodate the number of workers. Supply warm water to showers. Provide one shower for each eight workers. No worker or other person shall leave an Asbestos Control Area without showering. Shower water shall be collected and filtered using best available technology and dumped down an approved drain.

E. No personnel or equipment shall be permitted to leave the Asbestos Control Area unless just decontaminated by showering, wet cleaning or HEPA vacuuming to remove all asbestos debris. No asbestos-contaminated materials or persons shall enter the Clean Room.

3.3 EQUIPMENT DECONTAMINATION ENCLOSURE SYSTEM

A. Establish contiguous to the Work Area an Equipment Decontamination Enclosure System consisting of two (2) totally enclosed chambers divided by a double flap curtained opening. Other effective designs are permissible. This enclosure must be constructed so as to ensure that no personnel enter or exit through this unit.

3.4 SEPARATION OF WORK AREAS FROM OCCUPIED AREAS

A. Occupied areas and/or building space not within the Asbestos Control Area shall be separated from asbestos abatement Work Areas by means of airtight barriers. Barriers at openings with dimensions exceeding two (2) feet in both directions shall be blocked with fixed critical barriers.

B. Do not impair required building exits from any occupied building area. Where normal exits have been blocked by the asbestos work, provide temporary exit signs directing building occupants to the nearest available exit location.

C. Visually inspect and smoke test NPE barriers to assure an effective seal. Repair defects immediately.

D. Create a pressure differential in the range of 0.02 to 0.04 inches of water column between the Work Area and occupied areas by the use of acceptable pressure differential equipment. Provide a sufficient quantity of units to exhaust the volume of air within the Asbestos Control Area a minimum of four times per hour. Continuously monitor the pressure differential between the Work Area and occupied areas utilizing recording type equipment to ensure exhaust air filtration equipment maintains a minimum pressure differential of 0.02 inches of water column.

3.5 ASBESTOS REMOVAL – INTERIOR ABATEMENT

A. A Competent Person shall be on the job at all times to ensure the establishment and maintenance of the NPE and proper work practices throughout the project. Before beginning work within the NPE and at the beginning of each shift, the NPE shall be inspected for breaches and smoke tested for leaks, and any leaks sealed. Results of NPE inspections shall be logged.

B. Do not begin abatement work until authorized by the Project Monitor.

C. Spray asbestos materials with amended water, using airless spray equipment capable of providing a "mist" application to reduce the release of fibers during the removal operation.

D. In order to maintain indoor asbestos concentrations at a minimum, remove the wet asbestos in manageable sections. Materials shall not be allowed to dry out. Material drop shall not exceed 8 feet. For heights up to 15 feet provide inclined chutes or scaffolding to intercept drop. For heights exceeding 15 feet provide enclosed dust-proof chutes.

E. Fill disposal containers (six (6) mil polyethylene bags or fiber drums) as removal proceeds, seal filled containers, apply caution labels and clean containers before removal to wash area. Bags shall be securely sealed to prevent accidental opening and leakage by taping in gooseneck fashion. Bags may be placed in drums for staging and transportation to the disposal site. Bags shall be decontaminated by wet cleaning and HEPA vacuuming before being placed in clean drums and sealed with locking ring tops. Vinyl asbestos floor tile removed shall be placed in polypropylene burlap bags and then double poly bagged. Small components and asbestos containing waste with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which could tear polyethylene bags and sheeting shall be placed in polypropylene burlap bags and then double poly bagged. Wet clean each container thoroughly before moving to Holding Area. Ensure that workers do not enter from uncontaminated areas into the Washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the Equipment Decontamination Enclosure.

F. After completion of stripping work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped and sponged or cleaned by an

equivalent method to remove all visible material (wire brushes are not permitted). During this work the surfaces being cleaned shall be kept wet.

G. If at any time during asbestos removal, should the Project Monitor suspect contamination of areas outside the Work Area, the Contractor shall stop all abatement work and take steps to decontaminate these areas and eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until air sampling and visual inspections determine decontamination.

H. Containerize asbestos-containing waste material removed daily. Do not allow ACM to remain on the floor overnight, allowing it to dry out.

3.6 ASBESTOS REMOVAL – EXTERIOR ABATEMENT

A. A Competent Person shall be on the job at all times to ensure the establishment and maintenance of control measures and proper work practices throughout the project.

B. Do not begin abatement work until authorized by the Project Monitor.

C. Spray asbestos materials with amended water, using airless spray equipment capable of providing a "mist" application to reduce the release of fibers during the removal operation.

D. Cover ground under exterior removal activity with 10’ wide 6 mil polyethylene sheeting, weighted to withstand wind loading. Create a regulated area around the exterior removal area with warning tape and warning signs.

E. Fill disposal containers (six (6) mil polyethylene bags or fiber drums) as removal proceeds, seal filled containers, apply caution labels and clean containers before removal to wash area. Bags shall be securely sealed to prevent accidental opening and leakage by taping in gooseneck fashion. Bags may be placed in drums for staging and transportation to the disposal site.

F. If at any time during asbestos removal, should the Project Monitor suspect contamination of areas outside the Work Area, the Contractor shall stop all abatement work and take steps to decontaminate these areas and eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until air sampling and visual inspections determine decontamination.

G. Containerize asbestos-containing waste material removed daily. Do not allow ACM to remain on the ground overnight.

3.7 ALTERNATIVE WORK PRACTICE (AWP) PROCEDURES

A. The procedures described in this specification are to be utilized as the basis for bidding this project.

B. Alternative procedures require written letters of approval from the following parties:

1. Department of Public Health – Asbestos Program

The Contractor may not conduct asbestos removal utilizing the Alternative Work Practice until the written Alternative Work Practice approval letter from the Department of Public

Health is on the job site. Alternative Work Practice approvals shall be secured prior to implementation.

3.8 CLEAN-UP PROCEDURE

A. Remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris which may have splattered or collected on the polyethylene wall covering.

B. Remove contamination from the exteriors of the negative air machines, scaffolding, ladders, extension cords, hoses and other equipment inside the Work Area. Cleaning may be accomplished by brushing, HEPA vacuuming and/or wet cleaning.

C. The Project Monitor shall conduct a thorough visual inspection utilizing a high-intensity flashlight, with the containment barriers in place, to detect visible accumulations of dust or bulk asbestos-containing materials remaining in the Work Area. Should dust, debris or residue be detected, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean-up of the work site.

D. Once the area has been recleaned, any equipment, tools or materials not required for completion of the work, shall be removed from the Work Area. Negative air filtration devices shall remain in place and operating for the remainder of the clean-up operation.

E. Apply a lock-down encapsulant to all surfaces within the Work Area from which asbestos has been removed and the cleaned inner layer of polyethylene.

F. Air sampling for reoccupancy clearance shall be undertaken using aggressive sampling techniques. Analysis of clearance samples shall follow State of Connecticut Regulations, Section 19a-332a-12. Areas which do not comply shall continue to be cleaned by and at the Contractors expense, until the specified Standard of Cleaning is achieved as evidenced by results of air testing. When the Work Area passes the reoccupancy clearance, controls established by this specification may be removed.

G. Remove all remaining polyethylene, including critical barriers, and Decontamination Enclosure Systems leaving negative air filtration devices in operation. Dispose of poly sheeting as asbestos-contaminated waste. HEPA vacuum and/or wet wipe any visible residue which is uncovered during this process.

3.9 REINSTALLATION OF DISPLACED EQUIPMENT

A. After reoccupancy is granted, resecure mounted items removed during the course of the work to their former positions.

3.10 DISPOSAL OF ASBESTOS

A. Disposal of asbestos-containing and/or asbestos contaminated material shall occur at an authorized site and must be in compliance with the requirements of, and authorized

by the Office of Solid Waste Management, Department of Energy and Environmental Protection, State of Connecticut, or other designated agency having jurisdiction over solid waste disposal.

B. Disposal approval shall be obtained prior to commencement of asbestos removal.

C. Warning signs must be attached to vehicles used to transport asbestos-containing waste. Warning signs shall be posted during loading and unloading of disposal containers. The signs must be posted so that they are plainly visible.

D. Waste removal dumpsters and cargo areas of transport vehicles shall be lined with a layer of six (6) mil polyethylene sheeting to prevent contamination from leaking or spilled containers. Floor sheeting shall be installed first, and shall be extended up sidewalls 12-inches. Wall sheeting shall overlap floor sheeting 24-inches and shall be taped into place. Keep dumpsters locked when not in use.

E. Contractor is responsible for signing the asbestos waste shipment record as generator prior to each asbestos waste dumpster leaving site and giving a copy of the signed waste shipment record to the Owner. The completed waste shipment record with landfill sign-offs shall be forwarded to the Owner.

3.11 CONTRACTOR RESPONSIBILITY

A. Conduct air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.1101. Documentation of air sampling results must be recorded at the work site within twenty-four (24) hours of receipt of results, and shall be available for review until the job is complete.

3.12 AIR SAMPLING SCHEDULE

A. At a minimum, air sampling by the Project Monitor will be conducted in accordance with the following schedule:

Abatement Activity	Pre-Abatement	During Abatement	Post-Abatement
Greater than 160 s.f. or 260 l.f.	PCM	PCM	TEM
Equal to or less than 160 s.f. or 260 l.f.	PCM	PCM	PCM

B. Frequency and duration of the air sampling during abatement will be representative of the actual conditions during the abatement. The size of the asbestos project will be a factor in the number of samples required to monitor the abatement activities. In addition to OSHA compliance monitoring (personal sampling accomplished by the Contractor) the following minimum schedule of samples will be required:

1. Background Samples:

   a) Outside of building - 2.
   b) Adjacent Area(s) inside building - 2.
   c) Work Area - 3 or if areas are separated (such as rooms) at least one (1) sample per area equaling a minimum of three (3).

2. During Abatement:

   a) Outside of building at the exhaust of air filtering device - 2 per shift.
   b) Work Area - 2 per shift.
   c) Adjacent area inside building - 2 per shift.
   d) Outside of the Equipment Decontamination Enclosure System - 1 during removal of ACM waste.

3. Post-Abatement:

   a) Work Area - At least five (5) per homogenous work site or one (1) per room, whichever is greater.

C. Post-abatement clearance air monitoring requirements are as follows:

1. Air sampling will not begin until at least 2 hours after wet cleaning has been completed and no visible water or condensation remain.

2. Sampling equipment will be placed at random around the Work Area. If the Work Area contains the number of rooms equivalent to the number of required samples based on floor area, a sampler shall be placed in each room. When the number of rooms is greater than the number of samples a representative number of rooms will be selected.

3. The representative samplers placed outside the Work Area but within the building will be located to avoid any air that might escape through the isolation barriers and will be approximately 50 feet from the entrance to the Work Area, and 25 feet from the isolation barriers.

4. The following aggressive air sampling procedures will be used within the Work Area during all air clearance monitoring:

   a) Before starting the sampling pumps, direct the exhaust from forced air equipment (such as a 1 horsepower leaf blower) against all walls, ceilings, floors, ledges and other surfaces in the Work Area. This should take at least 5 minutes per 1000 SF of floor area.

   b) Place a 20-inch fan in the center of the room. (Use one fan per 10,000 cubic feet of room space.) Place the fan on slow speed and point it toward the ceiling.

   c) Start the sampling pumps and sample for the required time.

   d) Turn off the pump and then the fan(s) when sampling is complete.

5. Air volumes taken for clearance sampling shall be sufficient to accurately determine (to a 95 percent probability) fiber concentrations to 0.010 f/cc of air.

6. The clearance criteria for work areas cleared by PCM (Phase Contrast Microscopy) is that all 5 clearance samples must register less than or equal to 0.010 f/cc of air.

7. The clearance criteria for work areas cleared by TEM (Transmission Electron Microscopy) is that the average of the 5 clearance samples taken inside the work area must register less than 70 structures per square millimeter of filter area.

8. Each homogeneous Work Area which does not meet the clearance criteria shall be thoroughly recleaned using HEPA vacuuming and/or wet cleaning, with the negative pressure ventilation system in operation. New samples shall be collected in the Work Area as described above. The process shall be repeated until the Work Area passes the test, with the cost of repeat sampling being borne entirely by the Contractor.

9. For an asbestos abatement project with more than one homogeneous Work Area, the release criterion shall be applied independently to each Work Area.

D. TEM clearance turnaround time will be 24 hours after the TEM lab receives the samples by overnight mail.

3.13 ACTION CRITERIA

A. If air samples collected outside of the Work Area during abatement activities indicate airborne fiber concentrations greater than original background levels or greater than 0.010 f/cc, as determined by Phase Contrast Microscopy, whichever is larger, an examination of the Work Area perimeter shall be conducted and the integrity of barriers shall be restored. Cleanup of surfaces outside the Work Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming abatement activities.

END OF SECTION 02 8216

SECTION 06 1000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes the miscellaneous repair and replacement of the following components:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Wood blocking and nailers.
4. Plywood backing panels.
5. Exterior wood decking and framing.

B. Related Requirements:

1. Section 06 1600 "Sheathing" for sheathing, roof decking, subflooring, and underlayment.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal size or greater in least dimension.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
3. All deck framing and deck boards shall be pressure treated.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: All interior partitions.
2. Species:

a. Hem-fir (north); NLGA.
b. Southern pine or mixed southern pine; SPIB.
c. Spruce-pine-fir; NLGA.
d. Hem-fir; WCLIB, or WWPA.
e. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

f. Northern species; NLGA.
g. Eastern softwoods; NeLMA.
h. Western woods; WCLIB or WWPA.

B. Load-Bearing Partitions: Construction or No. 2 grade.

1. Application: Exterior walls and interior load-bearing partitions.
2. Species:

a. Hem-fir (north); NLGA.
b. Southern pine; SPIB.
c. Douglas fir-larch; WCLIB or WWPA.
d. Southern pine or mixed southern pine; SPIB.
e. Spruce-pine-fir; NLGA.
f. Douglas fir-south; WWPA.
g. Hem-fir; WCLIB or WWPA.
h. Douglas fir-larch (north); NLGA.
i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. Load-Bearing Partitions: Any species of machine stress-rated dimension lumber with a grade of not less than 1650f-1.5E.

1. Application: Exterior walls and interior load-bearing partitions.

D. Ceiling Joists: Construction or No. 2 grade.

1. Species:

a. Hem-fir (north); NLGA.
b. Southern pine; SPIB.
c. Douglas fir-larch; WCLIB or WWPA.
d. Douglas fir-larch (north); NLGA.
e. Southern pine or mixed southern pine; SPIB.
f. Spruce-pine-fir; NLGA.
g. Hem-fir; WCLIB or WWPA.
h. Douglas fir-south; WWPA.
i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
j. Northern species; NLGA.
k. Eastern softwoods; NeLMA.
l. Western woods; WCLIB or WWPA.

E. Joists, Rafters, and Other Framing Not Listed Above: Construction or No. 2 grade.

1. Species:

a. Hem-fir (north); NLGA.
b. Southern pine; SPIB.
c. Douglas fir-larch; WCLIB or WWPA.
d. Southern pine or mixed southern pine; SPIB.
e. Spruce-pine-fir; NLGA.

f. Douglas fir-south; WWPA.
g. Hem-fir; WCLIB or WWPA.
h. Douglas fir-larch (north); NLGA.
i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

F. Joists, Rafters, and Other Framing Not Listed Above: Any species of machine stress-rated dimension lumber with a grade of not less than 1650f-1.5E.

G. Wood Decking: 5/4” x 6” pressure treated deck boards, full and half length of deck (as indicated) only. Stagger between full and half lengths.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine or southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; No. 2 Common grade; NeLMA.
5. Northern species; No. 2 Common grade; NLGA.
6. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

E. Deck board fasteners: Stainless steel screws.

2.7 METAL FRAMING ANCHORS

A. Manufacturers: Basis of Design: Simpson Strong Tie Co. Inc. Subject to compliance with requirements, products by one of the following are also acceptable:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. USP Structural Connectors.

B. Allowable design loads, as published by manufacturer, shall meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

E. Joist Hangers: U-shaped joist hangers with 2-inch-long seat and 1-1/4-inch wide nailing flanges at least 85 percent of joist depth.

1. Thickness: 0.062 inch.

F. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

1. Strap Width: 1-1/2 inches.
2. Thickness: 0.062 inch.

G. Bridging: Rigid, V-section, nail less type, 0.050 inch thick, length to suit joist size and spacing.

H. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.

I. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

1. Width: 1-1/4 inches.
2. Thickness: 0.062 inch.
3. Length: 24 inches.

J. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick. Tie fastens to side of rafter or truss, face of top plates, and side of stud below.

K. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

L. Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches wide by 0.050 inch thick by 36 inches long.

M. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.

1. Bolt Diameter: 5/8 inch.
2. Width: 2-1/2 inches.
3. Body Thickness: 0.108 inch.
4. Base Reinforcement Thickness: 0.108 inch.

N. Wall Bracing: T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches wide by 9/16 inch deep by 0.034 inch thick with hemmed edges.

O. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch thick with hemmed edges.

2.8 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

E. Install shear wall panels to comply with manufacturer's written instructions.

F. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

G. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

H. Do not splice structural members between supports unless otherwise indicated.

I. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

J. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

K. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

L. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

M. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

N. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

O. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with approved or indicated fastener patterns where applicable.
2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.4 WALL AND PARTITION FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions and for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.

1. For exterior walls, provide 2-by-6-inch nominal size wood studs spaced 16 inches o.c. unless otherwise indicated.

2. For interior partitions and walls, provide 2-by-6-inch nominal and 2-by-4-inch nominal where indicated size wood studs spaced 16 inches o.c. unless otherwise indicated.
3. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
2. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated or, if not indicated, according to Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One- and Two-Family Dwellings.

D. Provide diagonal bracing in exterior walls, at both walls of each external corner, at 45-degree angle, full-story height unless otherwise indicated. Use 1-by-4-inch nominal-metal wall bracing, let into studs in saw kerf.

3.5 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 1000

SECTION 06 1600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Subflooring.
4. Underlayment.

B. Related Requirements:

1. Section 02 4119 "Selective Demolition"
2. Section 07 0150.19 “Preparation for Reroofing”
3. Section 07 3110 “Asphalt Shingles”
4. Section 07 4640 “Vinyl Siding & Soffits”

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory.

2.2 WOOD PANEL PRODUCTS

A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Certified Wood: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

C. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.

D. Oriented Strand Board: DOC PS 2.

2.3 FIRE-RETARDANT-TREATED PLYWOOD

A. Kiln-dry material after treatment to a maximum moisture content of 15 percent.

2.4 WALL SHEATHING

A. Plywood Wall Sheathing: Exposure 1, Structural I sheathing.

B. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural I sheathing.

2.5 ROOF SHEATHING

A. Plywood Roof Sheathing: Exposure 1, Structural I sheathing.

B. Oriented-Strand-Board Roof Sheathing: Exposure 1, Structural I sheathing.

1. Thickness: 1/2 inch or 5/8 inch (Field verify)

2.6 SUBFLOORING AND UNDERLAYMENT

A. Plywood Subflooring: Exposure 1 single-floor panels or sheathing.

1. Thickness: 3/4 inch.

B. Oriented-Strand-Board Subflooring: Exposure 1, Structural I sheathing.

C. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exterior B-C with fully sanded face.

1. Thickness: 1/4 inch.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2. Comply with CT State Building Code & Fastener schedule.

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01, ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Subflooring:

    a. Glue and nail to wood framing.
    b. Space panels 1/8 inch apart at edges and ends.

2. Wall and Roof Sheathing:

    a. Nail to wood framing.
    b. Space panels 1/8 inch apart at edges and ends.

3. Underlayment:

    a. Glue and nail to subflooring.
    b. Space panels 1/32 inch apart at edges and ends.
    c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

END OF SECTION 06 1600

SECTION 06 2023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior trim, including non-fire-rated interior door frames.
2. Shelving and clothes rods.

B. Related Requirements

1. Section 09 9000 "Painting" for priming and backpriming of interior finish carpentry.

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. MDO: Plywood with a medium-density overlay on the face.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

B. Samples: For each exposed product and for each color and texture specified.

C. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

D. Samples for Verification:

1. For each species and cut of lumber and panel products with nonfactory-applied finish, with half of exposed surface finished; 50 sq. in. for lumber and 8 by 10 inches for panels.
2. For each finish system and color of lumber and panel products with factory-applied finish, 50 sq. in. for lumber and 8 by 10 inches for panels.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.

1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
2. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by

the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece.

2.2 INTERIOR TRIM

A. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade: Eastern white pine; NeLMA or NLGA D Select.
2. Species and Grade: Idaho white, lodgepole, ponderosa, radiata, or sugar pine; NLGA or WWPA D Select.
3. Species and Grade: White woods; WWPA D Select.
4. Maximum Moisture Content: 15 percent with at least 85 percent of shipment at 12 percent or less.
5. Finger Jointing: Allowed.
6. Face Surface: Surfaced (smooth).
7. Optional Material: Primed MDF of same actual dimensions as lumber indicated may be used in lieu of lumber.

B. Moldings for Opaque Finish (Painted Finish): Made to patterns included in MMPA's "WM/Series Softwood Moulding Patterns." All molding patterns shall match existing and shall be verified on site – patterns specified herein are the basis of design.

1. Softwood Moldings: MMPA WM 4, P grade.

    a. Species: Eastern white, Idaho white, lodgepole, ponderosa, radiata, or sugar pine.
    b. Maximum Moisture Content: 15 percent with at least 85 percent of shipment at 12 percent or less.

2. Finger Jointing: Allowed.

2.3 SHELVING AND CLOTHES RODS

A. Closet Shelving: Made from one of the following materials, 3/4 inch thick:

1. Softwood Boards: Kiln-dried eastern white, Idaho white, lodgepole, ponderosa, radiata, or sugar pine; NeLMA, NLGA, or WWPA C Select (Choice).
2. Softwood Boards: Kiln-dried Douglas fir-larch, Douglas fir south, or hem-fir; SPIB Superior or C & Btr finish; NLGA, WCLIB, or WWPA; or southern pine; finish.

B. Shelf Cleats: 3/4-by-3-1/2-inch boards with hole and notch to receive clothes rods, as specified above for shelving.

C. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.

D. Shelf Brackets without Rod Support: BHMA A156.16, B04041; prime-painted formed steel.

E. Standards for Adjustable Shelf Supports: BHMA A156.9, B04071; zinc-plated steel.

F. Adjustable Shelf Supports: BHMA A156.9, B04081 or B04091; zinc-plated steel.

G. Clothes Rods: 1-1/2-inch diameter, clear, kiln-dried Douglas fir or southern pine.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Low-Emitting Materials: Adhesives shall comply with testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

2.5 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:

1. Interior standing and running trim, except shoe and crown molds.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.

1. Do not use pieces less than 24 inches long, except where necessary.
2. Stagger joints in adjacent and related standing and running trim.
3. Cope or Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.
4. Use scarf joints for end-to-end joints.
5. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
6. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
7. Install trim after gypsum-board joint finishing operations are completed.
8. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
9. Fasten to prevent movement or warping.
10. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 SHELVING AND CLOTHES ROD INSTALLATION

A. Cut shelf cleats at ends of shelves about 1/2 inch less than width of shelves and sand exposed ends smooth.

1. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled.
2. Space fasteners not more than 16 inches o.c. Use two fasteners at each framing member or fastener location for cleats 4 inches nominal in width and wider.
3. Apply a bead of multipurpose construction adhesive to back of shelf cleats before installing.
4. Remove adhesive that is squeezed out after fastening shelf cleats in place.

B. Install shelf brackets according to manufacturer's written instructions, spaced not more than 32 inches o.c. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

C. Install standards for adjustable shelf supports according to manufacturer's written instructions. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors. Space fasteners not more than 12 inches o.c.

D. Install standards for adjustable shelf brackets according to manufacturer's written instructions, spaced not more than 36 inches o.c. and within 6 inches of ends of shelves. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

E. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled.

1. Install shelves, fully seated on cleats, brackets, and supports.
2. Fasten shelves to cleats with finish nails or trim screws, set flush.
3. Fasten shelves to brackets to comply with bracket manufacturer's written instructions.

F. Install rod flanges for rods as indicated.

1. Fasten to shelf cleats, framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.
2. Install rods in rod flanges.

3.6 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements.

1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

B. Adjust joinery for uniform appearance.

3.7 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces.

B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.8 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 2023

SECTION 07 0150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Full tear-off of indicated roof system.
2. Re-cover preparation of indicated roof area.
3. Removal of flashings and counterflashings.
4. Temporary roofing.

B. Related Requirements:

1. Section 01 1000 "Summary" for use of premises and for phasing requirements.
2. Section 01 5000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.3 UNIT PRICES

A. Work of this Section is affected by roof sheathing removal and replacement unit price. See Section 01 2000 ALTERNATES, ALLOWANCES AND UNIT PRICES

1.4 DEFINITIONS

A. EPS: Molded (expanded) polystyrene.

B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.

C. OSB: Oriented strand board.

D. Partial Roof Tear-off: Removal of selected components and accessories from existing roofing system.

E. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

F. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

1.5 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at project site.

1. Meet with Owner, Architect, Construction Manager, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:

    a. Reroofing preparation, including roofing system manufacturer's written instructions.
    b. Temporary protection requirements for existing roofing system components that are to remain.
    c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
    d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
    e. Existing roof deck conditions requiring Architect notification.
    f. Existing roof deck removal procedures and Owner notifications.
    g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
    h. Structural loading limitations of roof deck during reroofing.
    i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
    j. Governing regulations and requirements for insurance and certificates if applicable.
    k. Existing conditions that may require Architect notification before proceeding.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Temporary Roofing Submittal: Product data and description of temporary roofing system.

1. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the temporary roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or specified special warranty.

1.7 ASSURANCE

A. Regulatory Requirements:

1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 FIELD CONDITIONS

A. Existing Roofing System: Asphalt shingle and underlayment roofing.

B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, entrances, and other adjacent occupied or used facilities.

D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
1. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.

E. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to 25 psf for uniformly distributed loads.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

A. Plywood: DOC PS 1, Grade CD, Exposure 1.

B. OSB: DOC PS 2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are Contractor's responsibilities.

2.3 INFILL AND REPLACEMENT MATERIALS

A. Plywood roof sheathing is specified in Section 06160 "Sheathing."

B. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

2.4 AUXILIARY REROOFING MATERIALS

A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.

B. Shut off rooftop utilities and service piping before beginning the Work.

C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

3.2 ROOF TEAR-OFF

A. Notify Owner each day of extent of roof tear-off proposed for that day.

B. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing roof deck.

1. Remove vapor retarder.
2. Remove base flashings and counter flashings.
3. Remove perimeter edge flashing.
4. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
5. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

D. Provide additional deck securement as indicated on Drawings.

E. Replace plywood roof sheathing as indicated on Drawings.

3.4 TEMPORARY ROOFING

A. Install approved temporary roofing over area to be reroofed.

B. Remove temporary roofing before installing new roofing.

C. Prepare temporary roof to receive new roofing according to approved temporary roofing proposal.

1. Restore temporary roofing to watertight condition.
2. Obtain approval for temporary roof substrate from roofing manufacturer and Architect before installing new roof.

3.5 BASE FLASHING REMOVAL

A. Remove existing base flashings.

1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain.

1. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish as existing.

3.6 DISPOSAL

A. Collect demolished materials and place in containers.

1. Promptly dispose of demolished materials.
2. Do not allow demolished materials to accumulate on-site.
3. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07 0150.19

SECTION 07 2100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Concealed exterior building insulation.
   2. Mineral wool insulation
   3. Weather barrier.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product test reports.

C. Research/Evaluation Reports: For foam-plastic insulation.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test- response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type X, 1.30 lb/cu. ft. (21 kg/cu. m), with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:

   1. Manufacturers:

      a. Dow Chemical Company.
      b. An approved equal.

2.2 MINERAL FIBER INSULATION

A. Semi-rigid mineral wool fire safing batt insulation.
   1. Products
      a. Rockwool Roxul Safe
      b. An approved equal

B. Performance Characteristics
   1. Flame Spread index =0 – ASTM E84
   2. Smoke Developed=0 - ASTM C665
   3. Test for Non-Combustibility -Non-combustible - ASTM E136

2.3 WEATHER BARRIER

A. Spun-bonded polyolefin non-woven weather barrier.

   1. Products:

      a. DuPont Tyvek – Homewrap.

      b. An approved equal.

B. Performance Characteristics

   1. Air Penetration: <.004 cfm/ft^2 at 1.57 psf, when tested in accordance with ASTM E2178. Type I per ASTM E1677.
   2. Water Vapor Transmission: 56 perms, when tested in accordance with ASTM E96-05, Method A.
   3. Water Penetration Resistance: 250 CM when tested in accordance with AATCC Test Method 127.
   4. Basis Weight: 1.8 oz/yd^2, when tested in accordance with TAPPI Test Method T-410.
   5. Air Resistance: 1200 seconds, when tested in accordance with TAPPI Test Method T- 460.
   6. Tensile Strength: 30/30 lbs/in., when tested in accordance with ASTM D882.
   7. Tear Resistance: 8/6 lbs., when tested in accordance with ASTM D1117.
   8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 15, Smoke Developed: 15.

C. Accessories

   1. Seam Tape: 2 or 3 inch wide, DuPont Tyvek Tape as manufactured by DuPont Building Innovations.
   2. Fasteners: DuPont Tyvek Wrap Caps, as manufactured by DuPont Building Innovations:
      #4 nails with large 1 inch plastic cap fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

3.3 INSTALLATION OF WEATHER BARRIERS

A. General: Extend weather barrier to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend weather barrier to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal horizontal joints in weather barrier over substrate by lapping not less than six inches. Fasten weather barrier to substrate at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (400 mm) o.c.

C. Firmly attach weather barrier to substrates with fasteners as recommended by weather barrier manufacturer.

D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating weather barrier with weather barrier tape to create an airtight seal between penetrating objects and weather barrier.

E. Repair tears or punctures in weather barriers immediately before concealment by other work. Cover with seam tape or another layer of weather barrier material.

END OF SECTION 07 2100

SECTION 07 3113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Asphalt shingles.
2. Felt underlayment.
3. Self-adhering sheet underlayment.
4. Ridge vents.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Samples: For asphalt shingles, ice shield, roof membrane and ridge vent.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain ridge vents, felt underlayment, self-adhering sheet underlayment and self-adhering roofing through one source from a single roofing manufacturer.

B. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.4 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period.

1. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first 5 years nonprorated. G.A.F. Materials Corp. “Smart Choice Limited Warranty.”
2. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Basis of Design shall be Timberline Series shingles as manufactured by G.A.F. 30 year warranty, 5 year Smart Choice Protection, 120 mph wind coverage. Or an approved Equal

2.2 UNDERLAYMENT MATERIALS

A. Felt: Underlayment:, ASTM D 6757; asphalt-impregnated fiberglass-reinforced organic felt designed for use on roof decks as a water-resistant layer beneath roofing shingles.

B. Self-Adhering Sheet Underlayment,; ASTM D 1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement, and "split" back plastic release film; Use in ‘low-slope’ areas (below 4:12, but no less than 2:12); provide material with warranty equal in duration to that of shingles being applied.

2.3 RIDGE VENTS

A. Ridge Vent: Rigid plastic ridge ventilator designed to allow the passage of air: Manufacturer's standard rigid section for use under ridge shingles: G.A.F. “Cobra Rigid Vent II, or approved equal.

1. Minimum Net Free Area: 18 square inches per foot.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum or hot-dip galvanized steel wire shingle nails, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter as recommended by underlayment manufacturer.

D. Starter Strip Shingles: G.A.F. “Universal Starter Strip Shingles” 8 ½ inches x 40 inches long.

2.5 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section 07620 "Sheet Metal Flashing and Trim".

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Single-Layer Felt Underlayment at slopes 4 ½" on 12 or more. Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 36 inches. Fasten with felt underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

B. Double-Layer Felt Underlayment at slopes less than 4 ½" on 12: Install double layers of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Install a 19-inch wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 36 inches. Fasten with felt underlayment nails.

1. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches in direction to shed water.

C. Self-Adhering Sheet Underlayment (Leak Barrier): Install self-adhering sheet underlayment; wrinkle free, on roof deck horizontally, nail in place in accordance with manufacturer's written instructions. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated, lapped in direction to shed water. Lap sides not less than 4 inches. Lap ends not less than 6 inches staggered 36 inches between courses. Roll laps with roller. Cover underlayment within seven days.

1. Eaves: On top of eave metal flashing, install leak barrier up slope from eave edge to 36 inches from the edge or at least 24 inches beyond the face of the warm exterior wall, which ever is greater; lap ends 6 inches and bond.

2. Valleys: Install leak barrier at least 36 inches wide centered on valley; lap ends 6 inches and seal.

3. At closed valleys: Install 36 inch wide felt underlayment centered in valley. Fasten to deck with nails.

   a. Lap roof deck felt underlayment over valley felt underlayment at least 6 inches.

   b. Install 36 inch wide strip of granular surfaced valley lining centered in valley, with granular surface up. Lap ends at least 12 inches in direction to shed water, and seal with asphalt roofing cement. Fasten to deck with nails.

   c. For additional information see drawings.

4. Install leak barrier at penetrations:

   a. At rake edges, install metal edge flashing over the leak barrier and roof deck protection; set tight to rake boards; lap joints at least 2 inches and seal with plastic cement; secure with nails.

   b. At hips and ridges, install leak barrier along entire lengths. I f ridge vents are to be installed, position leak barrier so the ridge slots are not covered.

   c. For additional information, see drawings.

5. Install minimum 4” wide strips of ASTM D 1970 compliant Self-Adhering Sheet Underlayment (Leak Barrier) over all joints in the roof decking in compliance with Connecticut 2018 amendments to the 2015 International Building Code, section R905.1.1 Underlayment

3.2 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

   1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

3.3 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed at least 7 inches wide with self-sealing strip face up at roof edge.

   1. Extend asphalt shingles 1 inch over fascia at eaves and rakes.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with 6-inch offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.

E. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches short of valley centerline. Trim upper concealed corners of cut-back shingle strips.

F. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

G. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 07 3113

SECTION 07 4600 - VINYL SIDING AND SOFFITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes vinyl siding and accessory materials.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For vinyl siding, include VSI's official certification logo printed on product data.

B. Samples: For siding and related accessories.

C. Qualification Data: For qualified vinyl siding Installer.

D. Product certificates.

E. Product test reports.

F. Maintenance data.

G. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Vinyl Siding Installer Qualifications: A qualified installer who employs a VSI-Certified Installer on Project.

B. Vinyl Siding Certification Program: Provide vinyl siding products that are listed in VSI's list of certified products.

C. Source Limitations: Obtain each type, color, texture, and pattern of siding, including related accessories, from single source from single manufacturer.

D. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace siding that fail(s) in materials or workmanship within specified warranty period.

1. Warranty Period: Manufacturer’s lifetime limited warranty from date of Substantial Completion.

1.5 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish full lengths of siding including related accessories, in a quantity equal to 2 percent of amount installed, for each color and type selected.

PART 2 - PRODUCTS

2.1 VINYL SIDING AND SOFFITS

A. General: Integrally colored vinyl siding complying with ASTM D 3679.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. CertainTeed Corp.
    2. An approved equal.

B. Siding:

1. For all types, textures and colors, refer to drawings.

2.2 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration and as indicated on the drawings.

1. Provide accessories in color and texture as listed on the drawings.

B. Decorative Trim: Integrally colored vinyl trim as indicated on the drawings complying with ASTM D 3679 except for wind-load resistance.

1. Texture: As indicated on the Drawings.
2. Color: As indicated on the Drawings.

C. Flashing: Provide aluminum flashing complying with Division 7 Section "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

D. Fasteners:

1. For fastening to wood, use siding nails of sufficient length to penetrate through exterior insulation and a minimum of 1 1/2 inch (28 mm) into wood substrate.
2. For fastening vinyl, use hot-dip galvanized fasteners. Where fasteners will be exposed to view, use prefinished aluminum fasteners in color to match item being fastened.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected

3.2 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

1. Do not install damaged components.
2. Center nails in elongated nailing slots without binding siding to allow for thermal movement.

B. Install vinyl siding and related accessories according to ASTM D 4756.

1. Install fasteners for horizontal vinyl siding no more than 16 inches (400 mm) o.c.

C. Install joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.

3.3 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 07 4600

07 5419 PVC ROOFING

PART 1 - GENERAL CONDITIONS

1.01 DESCRIPTION

A. Scope: Provide a complete Sarnafil G410 Fully Adhered System including membrane, flashings and other components. The completed roofing system shall function properly to protect the building against leakage and to resist all loads There shall be no leaks past the membrane, and the completed work shall be suitable for use as a roof on this building.

B. Related Work

The work includes but is not limited to the installation of:

1. Removal of existing roofing and insulation
2. Substrate Preparation
3. Vapor Retarder
4. Wood Blocking
5. Insulation
6. High density coverboard
7. Separation layers (if required)
8. Roof membrane
9. Fasteners
10. Adhesive for flashings
11. Roof Membrane flashings
12. Metal flashings
13. Sealants

C. Upon successful completion of work the following warranties may be obtained:

1. Sika Corporation Warranty
2. Roofing Applicator Warranty

1.02 QUALITY ASSURANCE

A. This roofing system shall be applied only by a roofing applicator authorized by Sika Corporation prior to bid (Sika Corporation "Applicator").

B. Upon completion of the installation and the delivery to Sika Corporation by the Applicator of certification that all work has been done in strict accordance with the contract specifications and Sika Corporation's requirements, a Sika Corporation Technical Service Representative will review the installed roof system wherever a System Warranty has been specified.

C. There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Owner's Representative and Sika Corporation.

D. All work pertaining to the installation of membrane and flashings shall only be completed by Applicator personnel trained and authorized by Sika Corporation in those procedures.

1.03 SUBMITTALS

At the time of bidding, the Applicator shall submit to the Owner (or Representative) the following:

A. Samples of each primary component to be used in the roof system and the manufacturer's current literature for each component.

B. Sample copy of Sika Corporation's warranty.

C. Sample copy of Applicator's warranty.

D. Dimensioned shop drawings which shall include:

1. Outline of roof with roof size and elevations shown.
2. Tapered insulation layout
3. Details of flashing methods for penetrations

E. Safety Data Sheets (SDS)

1.04 MOCK-UPS

A. Provide a complete, watertight mock-up at least 4 feet long, where directed by the Architect, of the typical deck condition at the exterior wing wall.

B. Modify and adjust the mock-up as requested in the review meeting.

1.05 CODE REQUIREMENTS

The Applicator shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

A. System shall be designed to meet a minimum wind design requirements of the most recent version of ASCE 7.

B. Underwriters Laboratories, Inc. - Northbrook, IL

1. Class A assembly

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not

accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

D. As a general rule all adhesives shall be stored at temperatures between 40°F and 80°F. Read instructions contained on adhesive canister for specific storage instructions.

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

F. Any materials which the Owner's representative or Sika Corporation determine to be damaged are to be removed from the job site and replaced at no cost to the Owner.

1.07 JOB CONDITIONS

A. Only work when environmental and weather conditions are suitable for the materials being used, in accordance with Sarnafil's recommended practices.

B. Install only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be heat welded before leaving the job site each day.

C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

D. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.

E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.

F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.

G. The Applicator is cautioned that certain Sarnafil membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with Sarnafil membranes. The application shall comply with all of Sarnafil's recommendations regarding contact with asphaltic and all other incompatible materials.

H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over Sarnafelt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air or similar methods.

J. The Applicator shall follow all safety regulations as required by OSHA and all other applicable authorities having jurisdiction.

K. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable City, State and Federal requirements.

L. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.

M. The Applicator shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.

N. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.

O. All rooftop contamination that is anticipated or that is occurring shall be reported to the Sarnafil representative to determine the corrective steps to be taken.

P. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Applicator shall report any such blockages in writing (letter copy to Sika Corporation) to the Owner's Representative for corrective action prior to the installation of the Sika Corporation roof system.

Q. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner of such condition in writing for correction at the Owner's expense (letter copy to Sika Corporation).

R. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the Owner's satisfaction.

S. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.

T. The Applicator shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values.

U. The Sarnafil membrane shall not be installed under the following conditions without consulting Sika Corporation’s Technical Dept. for precautionary steps:

1. The roof assembly permits interior air to pressurize the membrane underside.
2. The wall/deck intersection permits air entry into the wall flashing area.

V. Do not use Sarnacol adhesives at or near rooftop vents or air intakes or other locations where adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.

W. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.

X. All construction operations shall follow OSHA and other relevant fall protection and safety standards.

1.08 BIDDING REQUIREMENTS

A. Pre-Bid Meeting: A pre-bid meeting shall be held with the Owner's Representative and involved trades to discuss all aspects of the project. The Applicator's field representative or roofing foreman for the work shall be in attendance. Procedures to avoid rooftop damage by other trades shall be determined.

B. Site Visit: Bidders shall visit the site and carefully examine the areas in question as to conditions that may affect proper execution of the work. All dimensions and quantities shall be determined or verified by the Applicator. No claims for extra costs will be allowed because of lack of full knowledge of the existing conditions unless agreed to in advance with the Owner or Owner's Representative.

1.09 WARRANTIES

A. Sika Corporation Warranty: Upon successful completion of the work to Sika Corporation's satisfaction and receipt of final payment, the Sika Corporation Warranty shall be issued.

1. Membrane Warranty
2. System Warranty (only products purchased from Sika Corporation are covered under System Warranty)

B. Applicator/Roofing Contractor Warranty: Applicator shall supply Owner with a separate workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with Contract Documents, the Applicator shall repair that defect at no cost to the Owner. Applicator's warranty obligation shall run directly to Owner, and a copy shall be sent to Sika Corporation.

1.10 WARRANTY DURATION

A. Sika Corporation’s warranty shall be in effect for a 30-year duration for an 60 mil membrane.

B. Applicator’s/Roofing Contractor’s Warranty shall be in effect for a 2-year duration.

PART 2 - PRODUCTS

2.01 MEMBRANE

A. Membrane shall conform to:

ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II.

1. NSF/ANSI Standard 347, “Sustainability Assessment for Single Ply Roofing Membranes”. Certification Level: Platinum.
2. The manufacture to guarantee that the membrane thickness meets or exceeds [the specified thickness] when tested according to ASTM D751

B. Sarnafil G410-60 thermoplastic membrane with fiberglass reinforcement and lacquer coating.

C. Thickness: 60 mil.

D. Color of Membrane:
1. EnergySmart Reflective Gray, initial solar reflectance of 0.73, emittance of 0.89, and solar reflective index (SRI) of 90

E. Physical Properties shall comply with Sarnafil’s current published physical properties.

2.02 FLASHING MATERIALS

A. Wall / Curb Flashing

1. Sarnafil G410 Membrane: A fiberglass reinforced membrane adhered to approved substrates using Sarnacol adhesive.
2. G459 Flashing Membrane: A fiberglass reinforced membrane adhered to asphalt, other contaminated surfaces, or approved substrates using Sarnacol adhesive. G459 comes in 6.5’ and 3.25’ widths and is 60 mil thick. The standard color is white on tan. The tan side of the membrane must be the side exposed to the contamination.
3. Sarnaclad: Provide only stainless steel Sarnaclad, not galvanized, white color, meeting Sarnafil’s own published standards for the material. All fasteners for Sarnaclad shall also be stainless.

B. Perimeter Edge Flashing

1. Non-Typical Edge Joining to Flat Seam Copper: Project-specific perimeter edge detail reviewed and accepted for one-time use by Sika Corporation's Technical Department. Consult Regional Technical Manager prior to job start for review and consideration for acceptance.

C. Miscellaneous Flashing

1. Detail Membrane: A 60-mil fiberglass reinforced membrane, available 12″ x 50′ roll and 24″ x 50′ roll, more pliable than Sarnafil G410 membrane, good use for flashing pipes, corners, and unusual shaped penetrations.
2. Sarnacircles: A 60-mil thick prefabricated 4 1/2 in. round circle patch injection molded.
3. Sarnacorners – Inside or Outside: A 60-mil thick prefabricated inside or outside corner injection molded.
4. Sarnastack Universal, A, B, or C: Not permitted unless specifically allowed by Architect. Fabricate pipe penetrations from Sarnafil flashing materials to closely fit

the profile of the pipe.

5. Open Post Flashing: A 48-mil thick prefabricated flashing using weld technology convenient to flash obstructed rooftop conduits and pipes. Open post flashings are fabricated with an open seam and are available in different sizes.
6. Sarnadrain – Uflow: A seamless heavy-duty aluminum drain, featuring a coated flange for hot air welding of Sarnafil membranes. Sarnadrain-Uflow consists of a one-piece spun, 0.125 in., 11-gauge thick aluminum body, a 17.5” diameter, and a 12” long drain stem.
7. Sarnacol 2170 Adhesive: A solvent-based reactivating adhesive used to attach membrane to flashing substrate. Typical flashing substrate coverage rate is 45-60ft² /gal.
8. Sarnacol 2170 VC Adhesive: A solvent-based, VOC compliant, reactivating adhesive used to attach membrane to flashing substrate. Typical flashing substrate coverage rate is 45-60ft² /gal.
9. Liquid Flashing Primer: A two-component polymethyl methacrylate-based (PMMA) primer used to promote the adhesion of Liquid Flashing SW and Liquid Flashing WW over wood surfaces.
10. Liquid Flashing Fleece: A non-woven, needle-punched polyester fleece used as the reinforcement for Sika’s liquid flashing details systems.
11. Liquid Flashing Catalyst: A reactive agent based on dibenzoyl peroxide to induce curing of Sika’s Liquid Flashing SW, Liquid Flashing WW, and Liquid Flashing Primer when mixed.
12. Liquid Flashing SW (summer-grade white): A two-component polymethyl methacrylate-based (PMMA) liquid flashing material used with Liquid Flashing Fleece and cures to form a monolithic reinforced flashing membrane.
13. Liquid Flashing WW (winter-grade white): A two-component polymethyl methacrylate-based (PMMA) liquid flashing material used with Liquid Flashing Fleece and cures to form a monolithic reinforced flashing membrane. The ambient and surface temperatures at application must be between 23°F and 68°F.

2.03 INSULATIONS / ROOF BOARDS

A. Sarnatherm Iso Tapered: 25 psi rigid polyisocyanurate insulation board with a coated polymer bonded glass fiber mat facer.

B. Sarnatherm Roof Board H: High density polyisocyanurate roof board with a coated glass facer, 1/2-inch thickness, 100 psi or greater.

C. If Sarnatherm Roof Board H is not available, Contractor may substitute USG Securock Brand cement roof board in 4x4 or 4x8 sheets.

2.04 ATTACHMENT COMPONENTS

A. Membrane Adhesive: Where using fully adhered systems, provide the approved type of Sarnafil adhesive suitable for the applicable substrate and weather conditions, as

recommended by the Sarnafil representative.

B. Insulation / Roof Board Fasteners: Fully adhered to the substrate and weather conditions encountered, sufficient to achieve the rated uplift resistance.

2.05 VAPOR RETARDERS

A. Sika SA 31 Vapor Retarder 106 mil (thick self-adhered SBS polymer modified bitumen vapor retarder/air barrier with a non-woven polyester mat reinforcement and fine mineral aggregate (sand) topside. Can also serve as temporary roof protection exposed for up to three (6) months.

2.06 MISCELLANEOUS ACCESSORIES

A. Aluminum Tape: 2-inch-wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at Sarnaclad joints.

B. Multi-Purpose Tape: High performance sealant tape used with metal flashings as a preventive measure against air and wind-blown moisture entry.

C. Sarnastop: An extruded aluminum, low profile bar used with certain Sarnafasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate.

D. Sarnabar: An FM-approved, heavy-duty, 14-gauge, roll-formed steel bar used to attach membrane to roof decks. Provide stainless steel only, not galvanized.

2.07 SEALANTS AND PITCH POCKET FILLERS

A. Sikaflex-1a: A premium-grade, high-performance, moisture-cured, one-component polyurethane-based, non-sag elastomeric sealant used in wall, curb and drain terminations. It is also used as a sealant at pipe penetrations and under certain metal flashings.

B. Sikasil SG-15: A versatile one-component, non-sag, elastomeric, neutral cure silicone sealant used in wall and curb terminations.

C. Sarnafiller (two-component urethane adhesive for pitch pocket toppings): There shall be no pitch pockets unless specificially authorized by the Architect.

D. Mastic: Cold applied, fiber reinforced high strength SBS modified bitumen mastic that is specially formulated to detail around penetrations and flashings where Sika vapor retarders and hybrid system ply sheets are used.

2.08 MISCELLANEOUS FASTENERS AND ANCHORS

All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to

masonry shall be expansion type fasteners with stainless steel pins and low stress nylon expansion shields, not Zamac. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch and shall be approved for such use by the fastener manufacturer.

2.09 RELATED MATERIALS

A. Wood Nailer: Treated wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. Wood nailers shall conform to Factory Mutual Loss Prevention Data Sheet 1-49. All wood shall have a maximum moisture content of 19 percent by weight on a dry-weight basis.

B. Plywood: bonding directly to plywood, a minimum 3/4 inch CDX (C side out), smooth-surfaced exterior grade plywood with exterior grade glue shall be used. Rough-surfaced plywood or high fastener heads will require the use of Sarnafelt behind the flashing membrane. Plywood shall have a maximum moisture content of 19 percent by weight on a dry weight basis.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION CONFERENCE

A. The Applicator, Owner's Representative/Designer and Manufacturer(s) shall attend a pre-construction conference.

B. The meeting shall discuss all aspects of the project including but not limited to:

1. Safety
2. Set up
3. Construction schedule
4. Contract conditions
5. Coordination of the work

3.02 SUBSTRATE CONDITION

A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.

B. Applicator shall verify that the work done under related sections meets the following conditions:

1. Roof drains and scuppers have been reconditioned or replaced and installed properly.
2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
3. All surfaces are smooth and free of dirt, debris and incompatible materials.
4. All roof surfaces shall be free of water, ice and snow.

3.03 SUBSTRATE PREPARATION

A. All existing roofing, base flashing, metal flashings, and deteriorated wood blocking Remove only that amount of roofing and flashing which can be made weathertight with new materials during a one-day period or before the onset of inclement weather. The prepared substrate shall be acceptable to the Sarnafil representative as a substrate to receive the new roofing.

3.04 VAPOR RETARDER INSTALLATION

A. Application shall be directly over plywood substrate in strict accordance with the manufacturer's application instructions.

3.05 WOOD NAILER INSTALLATION

A. Install continuous code compliant wood nailers at the perimeter of the entire roof and around roof projections and penetrations as shown on the Detail Drawings.

B. Nailers shall be anchored to resist a minimum force of 300 pounds per lineal foot in any direction. Individual nailer lengths shall not be less than 3 feet long. Nailer fastener spacing shall be at 12 inches on center or 16 inches on center if necessary to match the structural framing. Fasteners shall be staggered 1/3 the nailer width and installed within 6 inches of each end. Two fasteners shall be installed at ends of nailer lengths. Nailer attachment shall also meet the requirements of the current Factory Mutual Loss Prevention Data Sheet 1-49.

C. Thickness shall be as required to match substrate or insulation height to allow a smooth transition.

D. Any existing nailer woodwork which is to remain shall be firmly anchored in place to resist a minimum force of 300 pounds per lineal foot in any direction and shall be free of rot, excess moisture or deterioration. Only woodwork shown to be reused in Detail Drawings shall be left in place. All other nailer woodwork shall be removed.

E. Stainless steel, corrosion resistant, fasteners are required when mechanically attaching to wood nailers

3.06 INSULATION / ROOF BOARD INSTALLATION

A. Fully adhere the insulation boards and membrane in place, using the type of Sarnafil-approved adhesive chosen for the substrates, insulation type, and weather conditions present. The entire installation shall meet uplift requirements as calculated by the current edition of ASCE-7.

3.09 HOT-AIR WELDING OF SEAM OVERLAPS

A. General

1. All seams shall be hot-air welded. All membrane to be welded shall be clean and dry.
2. All mechanics intending to use hot-air welding equipment shall have successfully completed a training course provided by a Sika Corporation Technical Service

Representative prior to welding.

3. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
4. Seam overlaps should be 3 inches wide when automatic machine-welding and 4 inches wide when hand-welding, except for certain details.

B. Hand-Welding

1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
2. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch wide nozzle shall be used.

C. Machine Welding

1. Machine welded seams are achieved by the use of approved automatic welding equipment. When using this equipment, all instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.
2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

D. Quality Control of Welded Seams

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark gray material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the Owner's Representative or Sika Corporation's representative. One inch wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

3.10 MEMBRANE FLASHING INSTALLATION

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Corporation. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

A. Sarnacol Adhesive for Membrane Flashings

1. Over the properly installed and prepared flashing substrate, the Sarnacol adhesive

shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.

2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.

B. Install Sarnastop/Sarnabar/Sarnacord according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Sarnastop is required by Sika Corporation at the base of all tapered edge strips and at transitions, peaks, and valleys according to Sika Corporation's details.

C. Sika Corporation's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by Sika Corporation prior to installation.

D. All flashings should extend a minimum of 8 inches (0.2 m) above roofing level, exceptions to this might be pipe boots and/or sealant pockets, etc. If in question, submit in writing to the Owner's Representative and Sika Corporation Technical Department for signed approval.

E. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the Sarnafil membrane.

F. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Sarnastop at 6 to 8 inches on center.

G. Sarnafil flashings shall be terminated according to Sika Corporation recommended details.

H. All adhered flashings that exceed 30 inches in height shall receive additional securement. Consult Sika Corporation Technical Department for securement methods.

3.11 LIQUID FLASHING INSTALLATION

A. Surface Preparation

1. All surfaces shall be clean, dry, free of dirt, dust, debris, loose particles, loose paint, rust and other contaminants.

2. Clean new roofing membrane with mineral spirits or all-purpose cleaner which will not remove the lacquer coating from the membrane. If the membrane is old or extremely soiled Sika Seam Cleaner should be used to restore the membrane to a ‘like new’condition before applying Liquid Flashing.

3. Clean and prepare metal surfaces to near white metal in accordance with SSPC-SP3 (power tool clean). If power tools are not available, use abrasive paper with a grain size of 20 to 40 to remove all loose particles including paint flakes and rust.

4. Lightly sand glass, rigid PVC and plastic surfaces. Extend surface preparation a minimum of 1/8 in beyond the termination of the flashing.

5. Wipe metal and glass surfaces with Sika’s Seam Cleaner and allow to dry.

6. For repairs or touch-up, wipe previously installed Liquid Flashing with Sika's Seam Cleaner to clean and reactivate the Liquid Flashing and allow to dry.
7. Prime wood with Liquid Flashing Primer. Allow Liquid Flashing Primer to cure completely before applying Liquid Flashing.
8. Apply painters tape to 'picture frame' and mask the outside edge of the detail. Place the tape 1/4 in beyond where the Liquid Flashing Fleece will terminate.
9. Pre-cut Liquid Flashing Fleece to fit around the penetration. Vertical flashing pieces must extend 2 in from the base and horizontal flashing pieces must extend 4 in out from the base. Flashing height should be a minimum of 8 in where possible.

B. Liquid Flashing Summer White (SW): Using Liquid Flashing SW ambient temperature must be between 59°F and 104°F when mixing. Thoroughly mix the entire container of Liquid Flashing SW with a slow-speed (200 to 400 rpm) mechanical mixer (electric drill with a mixing paddle) for two minutes.

Small Batch – 1 Liter

1. After mixing, pour 1 liter of Liquid Flashing SW into a clean plastic container.
2. Add 2 level tablespoons of Liquid Flashing Catalyst to Liquid Flashing SW and mix with a slow-speed mechanical mixer for two minutes.
3. Once mixed, the pot life is approximately 10 - 15 minutes depending on the ambient and surface temperature.

C. Liquid Flashing Winter White (WW: Using Liquid Flashing WW ambient temperature must be between 23°F and 68°F when mixing. Thoroughly mix the entire container of Liquid Flashing WW with a slow-speed (200 to 400 rpm) mechanical mixer (electric drill with a mixing paddle) for two minutes.

Small Batch – 1 Liter

1. After mixing, pour 1 liter of Liquid Flashing into a clean plastic container.
2. Add 4 level tablespoons of Liquid Flashing Catalyst to Liquid Flashing WW and mix with a slow-speed mechanical mixer for two minutes.
3. Once mixed, the pot life is approximately 10 - 15 minutes depending on the ambient and surface temperature.

D. Application

1. After mixing in the Liquid Flashing Catalyst, apply Liquid Flashing to the clean prepared surface using a small ½ in nap roller with rounded edges.
2. Apply 55 mils of Liquid Flashing evenly onto the substrate and terminate onto the inside edge of the painters tape. Place the Liquid Flashing Fleece into the wet Liquid Flashing taking care to remove any air bubbles and wrinkles. Terminate the Liquid Flashing Fleece 1/4 in from the inside edge of the painters tape. Apply additional Liquid Flashing at overlaps between the fleece layers.
3. Immediately apply 25 mils of additional Liquid Flashing to fully saturate the fleece. Extend Liquid Flashing onto the inside edge of the painters tape. Remove the painters tape immediately after the Liquid Flashing application.

4. Complex and irregular shapes such as nuts, bolts, etc. may require an additional 25 mil thick application of Liquid Flashing to ensure full coverage. Wait one hour before applying the additional coat.

3.12 METAL FLASHING INSTALLATION

A. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:

1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
2. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - latest issue.

B. Metal, other than that provided by Sika Corporation, is not covered under the Sika Corporation warranty.

C. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.

D. Metal shall be installed to provide adequate resistance to bending to allow for normal thermal expansion and contraction.

E. Metal joints shall be watertight.

F. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch.

G. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches on center into the wood nailer or masonry wall.

H. Counter flashings shall overlap base flashings at least 4 inches.

I. Hook strips shall extend past wood nailers over wall surfaces by 1-1/2-inch minimum and shall be securely sealed from air entry.

3.13 SARNACLAD METAL BASE FLASHINGS / EDGE METAL INSTALLATION

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Corporation. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

A. Sarnaclad metal flashings shall be formed and installed per the Detail Drawings.

1. All metal flashings shall be fastened into solid wood nailers with two rows of post galvanized flat head annular ring nails, 4 inches (100 mm) on center staggered. Fasteners shall penetrate the nailer a minimum of 1 inch (25 mm).

2. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

B. Adjacent sheets of Sarnaclad shall be spaced 1/4 inch apart. The joint shall be covered

with 2-inch-wide aluminum tape. A 4-inch minimum wide strip of Sarnafil flashing membrane shall be hot-air welded over the joint. Exercise caution at perimeter of roof.

3.14 EDGE METAL INSTALLATION

All perimeter details joining Sarnafil to flat seam copper in accordance with the approved mock-up. flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Corporation. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

3.15 COMPLETION

Prior to demobilization from the site, the work shall be reviewed by the Owner's Representative and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of Sika Corporation shall be itemized in a punch list. These items must be corrected immediately by the Applicator to the satisfaction of the Owner's Representative and Sika Corporation prior to demobilization.

All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

3.16 DETAILS

Refer to Typical System Details section or usa.sarnafil.sika.com.

END SECTION 07 5419

SECTION 08 1400 - FLUSH WOOD DOORS

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 work specified in this Section.

1.2 REFERENCE STANDARDS (most recent edition)

A. WDMA IS 1A - Window and Door Manufacturers Association (WDMA)

B. AWS - Quality Standards of the Architectural Woodwork Institute (AWI) & Woodwork Institute (WI)

C. NFPA 80 - Fire Doors and Windows

D. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies

E. Underwriters' Laboratories - UL 10B (neutral pressure) and UL 10C (positive pressure) – Fire Tests of Door Assemblies

F. ITS (Warnock Hersey) - Certification Listings for Fire Doors

G. ASTM E90-90 - Measurement of Airborne Sound Transmission Loss of Building Partitions

H. FSC - Forest Stewardship Council guidelines for environmentally certified wood doors

I. USGBC/LEED – US Green Building Council/Leadership in Energy and Environmental Design

1.3 SUMMARY

A. Section Includes: Solid-core doors with wood-veneer faces.
   a. Unit Interior Doors

B. Factory pre-fitting, pre-machining for hardware, detailing, glazing and factory pre-finishing.

1.4 SUBMITTALS

A. Product Data: Submit door manufacturer's product construction data, hardware attachment performance data, specifications and installation instructions for each type

of wood door, including details of core and edge construction, trim for lite openings and similar components.

B. Specific Product Warranty: The interior doors shall be warranted by the manufacturer to be free of manufacturing defects for the life of the original installation. Warranty shall provide for repair or replacement of the defective door(s) as originally furnished at manufacturer option. Manufacturer will assume reasonable costs associated with same, including re-hanging. Manufacturer may, per its discretion, elect to use either its own- or third-party resources to resolve warranty claims.

C. Shop Drawings: Provide the following information

1. Door type.
2. Door size.
3. Fire Rating.
   a. Neutral pressure - UL 10B/UBC43-2 or 7-2-94.
   b. Positive pressure - UL 10C/UBC7-2-97.
4. Hardware types and locations.
5. Hardware blocking requirements and location.
6. Vision panel or louver cutout size and location.
7. Pre-finish system type and approved

D. Samples:

1. Color samples for factory pre-finishing. Manufacturer must submit samples of not less than 6" x 6" size on representative veneer or paintable surface, with sample date indicated.

1.5 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, Doors to comply with WDMA IS 1A04 (Window and Door Manufacturers Association), AWS Section 9 (Architectural Woodwork Institute), or AWI with quality certification program (QCP).

B. Manufacturer: Company specializing in manufacturing products specified herein with a minimum of five years documented experience. All doors must be supplied through one Company.

C. Fire Ratings Compliance: Fire-rated wood doors to comply with NFPA-80 requirements according to building code standards having local jurisdiction.
1. Neutral Pressure Testing - UBC 43-2 or 7-2-94; or UL10B.
2. Positive Pressure Testing UBC 7-2-97 or UL10C.

D. Label Certification: All doors requiring fire rating shall carry either UL or ITS (Warnock

Hersey) label.

E. LEED Certification: All doors shall be manufactured under guidelines of LEED shall be built to the USGBC standards for contributing to LEED point calculations.

F. Environmental Certification: All doors require environmental certification and shall be marked with Forest Stewardship Council (FSC) authorized certificate. Environmental certification ensures that wood components come from certified forests and are processed by certified chain of- custody manufacturers.

G. Delivery/Storage/Handling: Store and protect doors in accordance with manufacturer's recommendations and WDMA or AWS Standards. Following are general guidelines.

1. Store doors flat and off the floor on a level surface in a dry, well-ventilated building. Do not store on edge. Protect/cover doors from dirt, water and abuse.
2. Certain wood species are light sensitive. Protect doors from exposure to light (artificial or natural) after delivery.
3. Do not subject interior doors to extremes in either heat or humidity. HVAC systems must be operational and balanced, providing a temperature range of 50 to 90 degrees Fahrenheit and 25% to 55% relative humidity.
4. When handling doors, always lift and carry. Do not drag across other doors or surfaces. Handle with clean hands or gloves.
5. Each door will be marked on top rail with opening number.

1.6 WARRANTY

A. Manufacturer's signed warranty covering manufacturing or material defects for life of original installation, including repair, replacement, machining, detailing glazing and/or pre-finishing, as well as re-hanging, is a required part of the manufacturer's warranty for interior doors.

PART 2 - PRODUCTS

2.1 DOORS FOR TRANSPARENT FINISH

A. Basis of Design:
B. Manufacturers are subject to evaluation and inclusion by architect. Listed below are primary manufacturers of Architectural Hot Press wood doors:
   1. Algoma Hardwoods, Inc.
   2. Eggers Industries
   3. Marshfield Door Systems
   4. VT Industries, Inc.
C. Face Veneer:

1. Face Grade Specified: “A”
2. Veneer Cut Specified: Rotary Cut
3. Veneer Species Specified: Birch
4. Veneer Match Specified: Book Match
5. Veneer Assembly Specified: Balance

D. Finish Type: Transparent over stain. Factory finish to be selected from manufacture's full line. See specifications herein for each type of door. Factory pre-finished doors to be individually protected with either transparent or opaque (cherry, mahogany, teak, walnut) poly-wrap at the factory. Final color, build, and sheen to be approved by architect based on actual review samples.

2.2 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory-pre-fit and bevel doors (3°) to suit frame sizes indicated, with 1/4" prefit in width, +/- 1/32", tolerances. Pre-fit top of door 1/8" +/- 1/16", and undercut as designated by floor condition. For fire-rated doors comply with NFPA 80 for pre-fits and undercuts.

C. Factory machine doors for hardware that is not surface applied. Locations and hole patterns to comply with specified hardware requirements as per NFPA 80 standards for doors specified; and to maintain door manufacturer's warranty.
1. Specific locations for hardware will be coordinated between existing frame and door manufacturers.
2. Specific hardware preps will be per hardware schedule(s) provided. Hardware preps to be neatly and cleanly squared as required per hardware specification.

D. ENVIRONMENTALLY CERTIFIED DOORS - Environmentally certified doors may carry a certification authorized under authority of the Forest Stewardship Council (FSC) requirements as pertaining to certified sourcing, recycled material content and chain-of-ownership requirements for materials used in construction of the door.

E. NON-FIRE-RATED, 1/3 HOUR FIRE-RATED DOORS
1. General Grade Specification: Aesthetic Grade: Custom Grade.
2. Performance Grade Specified: Heavy Duty.
3. Door Construction: Construct using Hot Press method for laminating face veneers and cross banding to the core. Cold pressing is not acceptable. Stiles and rails must be securely bonded to the core and then abrasively planed prior to veneering.

F. FLUSH WOOD DOORS, NO LITES: Structural Composite Lumber Core (SCLC-5)

engineered hardwood composite sometimes referred to as LSL (Laminated Strand Lumber). The material shall comply with WDMA/AWS minimum performance levels for interior applications with screw holding power of 540 lbs., modulus of rupture of 6,500 psi, modulus of elasticity of 1,300,000 psi and density of 38 lbs per cubic foot.

1. Stile Type: Compatible (Edge bands) 7/8" prior to factory trimming, glued to core.
2. Top & bottom rails Structural composite lumber or solid wood: 5-1/2" minimum top and bottom rails; 4- 1/2" x 18" minimum lock block.
3. Core Material: Structural composite lumber core.
4. Cross bands 1/16" minimum wood-based composite. Cross bands must extend the full width of the door. Minimum properties include internal bond of 100 psi and density of 50 lbs. per cubic foot.
5. Face Veneer as specified herein.
6. Veneer matching: As specified herein.
7. Adhesive Doors constructed using water-resistant adhesives (Type 2).
8. Factory machine with hinge and lock machining as well as rabbets, holders, drop seals, pivots, etc.
9. Factory Finish with performance characteristics equivalent to AWI System TR-6, catalyzed polyurethane, colors selected from the manufacturer's full line of available stain colors. Gloss Level: Satin
10. Warranty, full warranty for life of original installation.
11. Standards shall meet or exceed WDMA I.S.1-A Series, ARCHITECTURAL WOOD FLUSH DOORS. Architectural Woodwork Quality Standards Section 1300 and Architectural Flush Doors and Section 1500, Factory Finish.
12. Positive Pressure Category B: Singles and pairs require a category G edge seal applied to the frame. Pairs also require a category G edge seal applied to one of the meeting edge.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Confirm that frames comply with type, size, location and swing requirements and that they are installed plumb and square.

B. Inspect doors for any damage, manufacturing defects or pre-finish inconsistency prior to installation, e.g. wrong color or poor finish.

C. If frames and doors pass inspections (see A and B above), proceed to installation. If there are any issues in either frames or doors, do not proceed to installation. Contact appropriate supplier to correct unsatisfactory conditions, and proceed with installation only after corrections have been made.

3.2 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Installation of wood doors to comply with WDMA or AWI, specific door manufacturer's instructions, and NFPA 80.

C. Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
   1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated
   2. Protect doors following installation from damage that may occur as a result of project completion.
   3. Seal any edges trimmed during installation.

END OF SECTION 08 1400

SECTION 08 1600 – BI-FOLD CLOSET DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods or services referenced in or related to this Section shall also be bound by the Documents identified in Division 1 Section "Summary", Paragraph 1.1A, entitled "Related Documents."

1.2 SUMMARY

A. Section Includes:

1. Interior bi-fold wood doors, complete with hardware.

B. Related Section:

1. Division 9 Section "Painting" for field finishing stile and rail doors.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Include details of construction.
2. Include factory finishing specifications.

B. Shop Drawings: For stile and rail wood doors. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings; and other pertinent data, including the following:

1. Dimensions of doors for factory fitting.
2. Locations and dimensions of mortises and holes for hardware.

C. Product Certificates: For each type of door, from manufacturer.

D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain bi-fold wood doors from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written instructions and requirements of quality standard referenced in Part 2.

B. Package doors individually in opaque plastic bags or cardboard cartons.

C. Mark each door on top and bottom edge with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 50 and 90 deg F and relative humidity between 30 and 60 percent during the remainder of the construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship.

1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
2. Warranty shall be in effect during the following period of time from date of Substantial Completion:

a. Interior Bi-Fold Doors: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea-formaldehyde resins.

2.2 INTERIOR BI-FOLD WOOD DOORS

A. Interior Bi-Fold Wood Doors:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the following, or equal:

a. Landquist and Son, Inc.; Bi-Fold Door.

2. Door Panel: Fabricated with 45 lb. density industrial grade particleboard, 3/4-inch thick. Provide primed units with paint grade melamine panels on two sides.

a. All edges of the panels to be plasticized. Panels are hinged together with continuous piano hinges inserted into routed grooves and secured with tempered pins.
b. Hardware is to be factory applied to doors and track wherever practical.
c. Door brackets to have wrap around feature to eliminate all unnecessary

stress on the screws.

d. Pivot and mounting hardware to be made of 14 gauge cold rolled steel. Certain parts, where required, shall be carbonized for additional strength and durability.
e. Track: 13/16" X 1-1/4" No. 6063T6 extruded aluminum.
f. Track guides: Delrin.
g. Top pivot and guide pins: 3" removable compensating pins.
h. Pulls: Manufacturer's standard.

3. Finish: Factory primed.
4. Thickness: 1-1/8-inch.
5. Panel Type: Flush.

2.3 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime doors with one coat of wood primer. Seal all four edges, edges of cutouts, and mortises with primer.

2.4 FINISHING

A. Field finish factory primed MDF doors to comply with requirements in Division 9 Section "Painting."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and substrates, with Installer present, for suitable conditions where bi-fold wood doors will be installed.

1. Verify that installed frames comply with indicated requirements for type, size, location, and sliding characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Condition doors to average prevailing humidity in installation area prior to hanging.

B. Install doors in accordance with manufacturer's instructions and as indicated

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 1600

DIVISION 08 1613 - FIBERGLASS ENTRY DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Impact Resistant Fiberglass Entry Doors

1.2 RELATED SECTIONS

A. 08 71 00 – Door Hardware

B. 09 90 00 - Painting and Coating

1.3 REFERENCES

A. Fenestration and Glazing Industry Alliance (formally American Architectural Manufacturers)

1. AAMA/WDMA/CSA 101/I.S. 2 / A440-17 North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
2. AAMA/WDMA/CSA 101/I.S. 2 / A440-11 North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
3. AAMA/WDMA/CSA 101/I.S. 2 / A440-08 North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
4. AAMA 920 – Specifications for Operating Cycle Performance of Active Side Hinged Exterior Door Slabs.
5. AAMA 925 – Specification for Determining the Vertical Loading Resistance of Side Hinged Door Systems.
6. AAMA 1304 – Voluntary Specification for Determining Forced Entry Resistance of Side Hinged Door Systems.
7. AAMA 1702.2 – Voluntary Standard for Utilization in Manufactured Housing for Swinging Exterior Passage Doors.

B. American National Standards Institute

1. ANSI/BHMA A156.2 – Performance Standard for Bored and Preassembled Locks and Latches.

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

1. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
2. ASTM E 283 – Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
3. ASTM E 330 – Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
4. ASTM E 331 – Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
5. ASTM E 413 – Classification for Rating Sound Insulation (STC).

6. ASTM E 547 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
7. ASTM E 987 – Standard Test Methods for Deglazing Force of Fenestration Products.
8. ASTM E 1300 – Standard Practice for Determining Load Resistance of Glass in Buildings.
9. ASTM E 1332 – Standard Classification for Determination of Outdoor-Indoor Transmission Class.
10. ASTM E 1886-19 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
11. ASTM E 1996-17 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
12. ASTM E 2235 – Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods.

F. Environmental Protection Agency and Department of Energy:
1. Energy Star Program Requirements Product Specification for Residential Windows, Doors, and Skylights.

G. Code of Federal Regulations:
1. 24 CFR 3280 – Manufactured Home Construction and Safety Standards
2. 24 CFR 3282 – Manufactured Home Procedural and Enforcement Regulations
3. CFR 1201 Part 2 – Safety Standard for Architectural Glazing Materials.

I. Housing & Urban Development
1. HUD UM89 – HUD Building Product Standards and Certification Program for Exterior Insulated Steel Door Systems.

J. National Fenestration Rating Council
1. NFRC 100 – Procedure for Determining Fenestration Product U-Factors.
2. NFRC 200 – Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance (VT) at Normal Incidence.
3. NFRC 400 – Procedure for Determining Fenestration Product Air Leakage.

1.4 PERFORMANCE REQUIREMENTS

A. Doors shall have a structural design pressure rating of DP per CT State building code.

B. Doors shall have an impact design pressure rating of DP per CT State building code.

C. Door Unit Air Leakage, NFRC 400, 1.57 psf (25 mph): 0.50 cfm per square foot of frame or less.

D. Door Unit Water Penetration: No water penetration through door unit when tested in accordance with ASTM E 331or ASTM E 547 with water applied at rate of 5 gallons per hour per square foot at 0 psf.

E. Doors shall have a minimum STC rating of 26 or a minimum OITC rating of 23.

F. Doors shall have a minimum/maximum U-Value of 17.

G. Doors shall qualify for Energy Star Rating.

1.5 SUBMITTALS

A. Refer to Division 01 3300 Submittal Procedures.

B. Product Data: Submit door manufacturer current product literature, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections, anchorage methods and locations, accessories, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size verification sample of door illustrating glazing system, quality of construction, texture, and color of finish.

E. Warranty: Submit a specimen warranty for each product specified within.

1.6 QUALITY ASSURANCE

A. Mockup:

1. Provide sample unit of representative product size and using manufacturer approved installation methods to determine acceptability of door installation methods.
2. Approved mockup shall represent minimum quality required for the Work.
3. Approved mockup shall [not] remain in place within the Work.

A. Quality Assurance Submittals:

1. Provide documentation for specified performance as required.
2. Manufacturers’ installation instructions.

B. Manufacturer Qualifications: Manufacturer shall have successful experience in producing the type of product required for project applications equivalent to the requirements for this project.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Refer to Division 01 6000 Product Requirements.

B. Delivery: Deliver materials to site undamaged with labels clearly identifying manufacturer, product name, and installation instructions

C. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.

D. Handling: protect materials and finish during handling and installation to prevent damage.

1.8 WARRANTY

A. Provide a manufacturer's standard warranty for all components including door leaf, frame, sill and casing will be free from material and workmanship defects for a period of three years subject to certain limitations and restrictions. For complete details and current warranty information go to www.thermatru.com.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of design:

Therma-Tru Corp.
1750 Indian Wood Circle
Maumee, OH 43537
(419) 891-7400
(800) 843-7628
www.thermatru.com

Contact: Rod Clark (458) 206-8532 rclark@thermatru.com

B. Requests for substitutions will be considered in accordance with provisions of Division 01 6000. Other acceptable manufacturers:

1. Pella
2. Masonite

2.2 FIBERGLASS ENTRY DOORS

A. Basis of Design: Therma-Tru Corp.

1. Construction: 3/32" minimum thickness proprietary fiberglass reinforced thermoset composite, "AccuGrain" textured to duplicate hand-crafted hardwood master or smooth surface. Door edges are machinable kiln-dried hardwood, flush and square with door faces, lock edge reinforced with full-length integrated 3-1/2-inch-wide engineered lumber core. Door bottom edge is moisture- and decay-resistant composite. Core is foamed-in-place polyurethane, with a minimum density of 1.9 pcf.
3. Door Style Classic-Craft® Canvas Collection: CCV060.

B. Frames: Basis of Design: Provide the frame below and assembled by third party fabricators to exacting specifications from manufacturer to help maximize system performance.

1. Rot Resistant – frames, and brickmould casing in Smooth White.
2. Jamb Width: Standard 4 9/16".

C. Sills

1. Inswing: Composite Adjustable.
2. Finish: Mill.

2.3 HARDWARE

A. Hinges: Steel 4 x 4 x 0.098 inches finished to match hardware, plated screws to match.
   1. Ball Bearing: Stainless Steel US32D.
   2. Spring Loaded: Stainless Steel US32D.

B. Locking Hardware:
   1. Deadbolt: Factory prep door and frame for specified hardware.

2.4 INSTALLATION ACCESSORIES

A. Sill pan

B. Corner seal pad

C. Sill Cover

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive doors. Notify Architect in writing any unacceptable conditions that would adversely affect installation or subsequent performance of the product. Do not proceed with installation until unsatisfactory conditions are corrected.

   1. Verify sizes of doors infield, including all dimensions and conditions that will affect the installation, including wall thickness, rough opening, width, height, subfloor/finish floor construction, and exterior wall thickness.

3.2 INSTALLATION

A. Install fiberglass doors in full compliance with manufacturer’s written instructions and approved shop drawings.

B. Maintain alignment and compatibility with adjacent work.

   1. Remove existing door, frame, exterior brick mold casing and interior casing.
   2. Install flashing and weather resistive barrier system.
   3. Install frame in existing rough opening per details. Provide 3 shims per jamb. Shim behind each hinge. Replace 2 hinge screws/hinge with minimum 2 ½” long screws fully penetrating structure.
   4. Provide interior casing as specified and detailed.

3.3 FINISHING

A. Site Finish - Finish in compliance with manufacturer's written recommendations. See section 09 9000 "Painting and Coatings"

3.4 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION 08 1613

SECTION 08 18 16 - FIBERGLASS SLIDING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fiberglass sliding doors.

1.2 RELATED SECTIONS

A. Section 07 9200 - Joint Sealants: Sealants and caulking.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
   2. AAMA 624 - Voluntary Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles.

B. American Society for Testing and Materials (ASTM):
   1. ASTM C 1036 - Flat Glass.
   2. ASTM C 1048 - Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
   3. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
   4. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
   5. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
   6. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

C. Screen Manufacturers Association (SMA):
   1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.

D. Window and Door Manufacturers Association (WDMA):
   1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.

1.4 PERFORMANCE REQUIREMENTS

A. Doors shall be Hallmark certified to a rating of SGD-R-PG 30 specifications in accordance with ANSI/AAMA/WDMA 101/I.S.2/A440-08 or ANSI/AAMA/WDMA 101/I.S.2/A440-11.

B. Door Air Leakage, ASTM E 283: Door air leakage when tested at 1.57 psf (25 mph) shall be 0.15 cfm/ft^2 of frame or less.

C. Window Unit Water Penetration: No water penetration through window unit when tested in

accordance with ASTM E 547, under static pressure of 7.5 psf (52 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot..

1.5 SUBMITTALS

A. Submit in accordance with Division 1 requirements.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of door illustrating glazing system, quality of construction, and color of finish.

1.6 QUALITY ASSURANCE

A. Mockup:
1. Provide sample installation for field testing door performance requirements and to determine acceptability of door installation methods.
2. Approved mockup shall represent minimum quality required for the Work.

3. Approved mockup shall remain in place within the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage:
1. Store materials in accordance with manufacturer's instructions.
2. Store materials off ground and under cover.
3. Protect materials from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 FIBERGLASS SLIDING DOORS

A. Sliding Doors: Pella Impervia.

B. Door Panels:
1. Interior and Exterior Panel: Pultruded, fiberglass composite [with foam inserts].
2. Vent Panel: Removable for cleaning exterior glass.
3. Panel Corners:
a. Mitered.
b. Bonded and injected with moisture curing, hot-melt silicone adhesive.

C. Weather Stripping:
1. Head, Jamb, and Sill: Dual-extruded flexible polypropylene bulb.
2. Interlocker of Vent Panel: Dual-extruded flexible polypropylene bulb.

2.3 GLAZING

A. Glazing:
1. Float Glass: ASTM C 1036, Quality 1.
a. Tempered Glass: ASTM C 1048.

2. Dual-seal, fully tempered, insulating glass, silicone-glazed, multi-layer Low-E coated with argon: Basis of design Pella Advanced Comfort Low -E.

2.3 OPTIONS

A. Sliding Insect Screens: Standard:
1. Compliance: ASTM D 3656 and SMA 1201.
2. Screen Cloth: Vinyl-coated fiberglass, 18/16 mesh.
3. Self-closing, top hung on 2 adjustable nylon rollers, room side of door panels.
4. Adjustable frame-mounted strike.
5. Complete with necessary hardware.
6. Interior and Exterior Handle Finish: Match interior door handle finish.

B. Grilles-between-the-glass.
1. Profile: 3/4 inch.
2. Contoured aluminum grilles installed between 2 panes of the sealed insulating glass.
3. Color: White.

2.4 HARDWARE

A. Handles:
1. Interior Handle and Thumb Lock:

a. Finish: White

4. Exterior Handle and Key Lock: K-keyway pinlock cylinder.

a. Finish: Baked enamel, color to match door exterior cladding.
b. Key Lock Finish: Stainless steel.

B. Locking System:

1. Single-Point Lock Hardware: Electroplated steel with adjustable stainless-steel strike.

C. Vent Panel Rollers:

1. Two adjustable, permanently sealed, electroplated steel with organic coating, ball-bearing rollers, set on stainless steel track.

2.5 TOLERANCES

A. Doors shall accommodate the following opening tolerances:
1. Horizontal Dimensions Between High and Low Points: Plus 1/4-inch, minus 0 inch.
2. Width Dimensions: Plus 1/4-inch, minus 0 inch.
3. Building Columns or Masonry Openings: Plus or minus 1/4-inch from plumb.

2.6 FINISH

A. Exterior and Interior Finish: Pella EnduraClad.
1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
   a. Clean and etch aluminum surface of oxides.
   b. Pre-treat with conversion coating.
   c. Top coat with baked-on polyester enamel.
2. Color: White
3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
   a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
   b. Film Adhesion: 1 mm crosshatch, dry, wet, boiling water.
   c. Impact Resistance: 1/10-inch distortion, no film removal.
   d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
   e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
   f. Corrosion Resistance: ASTM G85-A5, 2000 hours. Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: Factory finished with 1 prime coat and 1 top coat of White.

2.7 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.
1. Aluminum-foil-backed butyl window and door flashing tape.
2. Maximum Total Thickness: 0.013 inch.
3. UV resistant.
4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: “Pella Window and Door Installation Sealant” or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

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

B. Install doors to be weather-tight and freely operating.

C. Maintain alignment with adjacent work.

D. Secure assembly to framed openings, plumb and square, without distortion.

E. Integrate door system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with door manufacturer's instructions.

G. Seal door to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

H. Leave doors closed and locked.

3.3 CLEANING

A. Clean door frames and glass in accordance with Division 1 requirements.

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

C. Remove labels and visible markings.

3.4 PROTECTION

A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION 08 1816

SECTION 08 5413 - FIBERGLASS WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fiberglass windows.

1.2 RELATED SECTIONS

A. Section 07 92 00 - Joint Sealants: Sealants and caulking.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
   2. AAMA 624-10 - Voluntary Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles.

B. American Society for Testing and Materials (ASTM):
   1. ASTM C 1036 - Flat Glass.
   2. ASTM C 1048 - Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
   3. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
   4. ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
   5. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
   6. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
   7. ASTM F 2090 – Standard Specification for Window Fall Prevention Devices With Emergency Escape (Egress) Release Mechanisms

C. Window and Door Manufacturers Association (WDMA):
   1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.

D. Screen Manufacturers Association (SMA):
   1. SMA 1201 – Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.

E. Window and Door Manufacturers Association (WDMA):
   1. AAMA/WDMA/CSA 101/I.S.2/A440 – North American Fenestration Standard/Specification for Windows, Doors, and Skylights.

1.4 PERFORMANCE REQUIREMENTS

A. Windows shall be Hallmark certified to a rating of LC, Minimum Performance grade PG specifications in accordance with ANSI/AAMA/WDMA 101/I.S.2/A440-08 or ANSI/AAMA/WDMA 101/I.S.2/A440-11.

B. Window Air Leakage, ASTM E 283: Window air leakage when tested at 1.57 psf (25 mph) shall be 0.05 cfm/ft^2 of frame or less.

C. Window Water Penetration, ASTM E 547: No water penetration through window when tested under static pressure of 7.5 psf (42 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

D. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F

E. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.28.

1.5 SUBMITTALS

A. Submit in accordance with Division 1 requirements.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.

1.6 QUALITY ASSURANCE

A. Mockup:
1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
2. Approved mockup shall represent minimum quality required for the Work.

3. Approved mockup shall remain in place within the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage:
1. Store materials in accordance with manufacturer's instructions.
2. Store materials off ground and under cover.

3. Protect materials from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 FIBERGLASS WINDOWS

A. Windows: Pella Impervia.
1. Factory-assembled fiberglass casement and awning windows with outward-opening sash installed in frame.
2. Frame and Sash Material: 5-layer, pultruded-fiberglass material, reinforced with interlocking mat.

B. Frame:
1. Select woods, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
2. Overall Frame Depth: 5 inches.
3. Nominal Wall Thickness of Fiberglass Members: 0.050 inch to 0.090 inch.
4. Frame Corners:
   a. Mitered.
   b. Joined and bonded with Neutral-cure Room Temperature Vulcanizing silicone hot-melt adhesive, with corner lock.
5. Jambs: Contain factory-drilled installation screw holes.

C. Sash:
1. Sash Corners:
   a. Mitered.
   b. Bonded and sealed with injected Neutral-cure Room Temperature Vulcanizing silicone hot-melt adhesive.

D. Glazing:
1. Float Glass: ASTM C 1036, Quality 1.
   a. Tempered Glass: ASTM C 1048.

2. Type: multi-layer Low-E coated with argon dual-seal insulating glass, silicone-glazed. Obscure as indicated on drawings. Basis of Design Pella Advanced Comfort Low -E

2.3 OPTIONS

A. Insect Screens: Standard.
   1. Compliance: ASTM D 3656 and SMA 1201.
   2. Screen Cloth: Vinyl-coated fiberglass, 18/16 mesh.
   3. Set in aluminum frame fitted to inside of window.
   4. Complete with necessary hardware.
   5. Screen Frame Finish White

B. Grilles-Between-the Glass:
   1. Profile: 3/4 inch.
   2. Contoured aluminum grilles installed between 2 panes of the sealed insulating glass.
   3. Interior Grille Color:White
   4. Exterior color: White

2.4 HARDWARE

A. Operator:
   1. Steel worm-gear operator with hardened gears.
   2. Operator Base: Zinc die cast with painted finish.
   3. Operator Linkage, Hinge Slide, and Hinge Arms: Stainless steel
   4. Exposed Fasteners: Stainless steel
   5. External Hardware Salt Spray Exposure, ASTM B 117: Exceed 1,000 hours

B. Crank Handle Finish
   1. Integrated Folding Crank: White

C. Locking System: multi-point lock system
   1. Single-handle locking system.
   2. Operate positive-acting arms that reach out and pull sash into locked position.
   3. Casement Windows: One installed on sash 29 inches and smaller in frame height, 2 unison operating locks installed on sash over 29 inches in frame height.
   4. Lock Handle Finish: White

D. Hinges:
   1. Wash hinges at non-emergency egress windows.
   2. Side pivot hinges at emergency egress and rescue windows. Must allow window to open beyond 90 degrees and not reduce window clear opening to meet emergency escape and rescue window requirements.

2.5 TOLERANCES

A. Windows shall accommodate the following opening tolerances:
   1. Vertical Dimensions Between High and Low Points: Plus 1/4-inch, minus 0 inch.
   2. Width Dimensions: Plus 1/4-inch, minus 0 inch.
   3. Building Columns or Masonry Openings: Plus or minus 1/4-inch from plumb.

2.6 FINISH

A. Exterior and Interior Finish: Pella EnduraClad.
1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
   a. Clean and etch aluminum surface of oxides.
   b. Pre-treat with conversion coating.
   c. Top coat with baked-on polyester enamel.
2. Color: White
3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
   a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
   b. Film Adhesion: 1 mm crosshatch, dry, wet, boiling water.
   c. Impact Resistance: 1/10-inch distortion, no film removal.
   d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
   e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
   f. Corrosion Resistance: ASTM G85-A5, 2000 hours. Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: Factory finished with 1 prime coat and 1 top coat of White.

2.7 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.
1. Aluminum-foil-backed butyl window and door flashing tape.
2. Maximum Total Thickness: 0.013 inch.
3. UV resistant.
4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: “Pella Window and Door Installation Sealant” or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive windows. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

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

B. Install windows to be weather-tight.

C. Maintain alignment with adjacent work.

D. Secure assembly to framed openings, plumb and square, without distortion.

E. Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using [insulating foam sealant] [backer-rod and sealant].

G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

3.3 FIELD QUALITY CONTROL

A. Field Testing: Field water testing shall be conducted in accordance with ASTM E1105 Test Procedure B. The test pressure shall be based on the maximum positive components and cladding design pressure. Utilizing the AAMA 502 field test reduction, the water test pressure is 10% of the maximum positive design pressure.

3.4 CLEANING

A. Clean window frames and glass in accordance with Division 1 requirements.

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

C. Remove labels and visible markings.

3.5 PROTECTION

A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION 08 5413

SECTION 08 7100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:
    a. Bedroom Doors
    b. Closet Doors
    c. Basement Entry Doors

B. Products under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Details of electrified door hardware.

C. Samples: For each exposed product and for each color and texture specified.

D. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

    a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
    b. Content: Include the following information:

        1) Identification number, location, hand, fire rating, size, and material of each door and frame.
        2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
        3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Door Hardware: One complete hardware set of each type.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:

C. Source Limitations: Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch of water.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

B. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
      a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
   2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames. Outswinging doors shall have non-removable security type hinges.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
      a. McKinney Products Company; an ASSA ABLOY Group company.

2.3 SELF-CLOSING HINGES AND PIVOTS

A. Self-Closing Hinges and Pivots: BHMA A156.17.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    a. McKinney Products Company; an ASSA ABLOY Group company.

2.4 MECHANICAL LOCKS AND LATCHES

A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.

B. Bored Locks: BHMA A156.2; Grade 2.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    a. Arrow CL Series Residential Locks.

2.5 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    a. IVES Hardware; an Ingersoll-Rand company.
    b. Rockwood Manufacturing Company.
    c. Trimco.

2.6 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    a. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    b. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    c. Zero International.

2.7 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:

    a. IVES Hardware; an Ingersoll-Rand company.
    b. Rockwood Manufacturing Company.
    c. Trimco.

2.8 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:

    a. Baldwin Hardware Corporation.
    b. Rockwood Manufacturing Company.
    c. Trimco.

B. Viewers (Peepholes).

1. All entrance doors to units shall include fish-eye viewers by the following manufacturers:

    a. Schlage Home Security.
    b. Rockwood Manufacturing Company
    c. ASSA ABLOY Hospitality

C. Wall and Door Stops: All interior and exterior inswing doors shall include floor mounted wall stops as applicable, per the architects direction by providing products by one of the following manufacturers.

    a. Rockwood, an ASSA ABLOY Group company.
    b. Stanley Hardware
    c. Schlage Door Accessories

2.9 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum

fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:

    a. Wood or Machine Screws: For the following:

        1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
        2) Strike plates to frames.
        3) Closers to doors and frames.

    b. Steel Through Bolts: For the following unless door blocking is provided:

        1) Surface hinges to doors.
        2) Closers to doors and frames.
        3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.10 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

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

PART 3 - EXECUTION

3.1 INSTALLATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

C. Mounting Heights: Mount door hardware units at heights indicated on Drawings and/or to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Interior Doors in new frames – match existing preparation of existing doors in same dwelling unit.
2. Interior Doors installed in existing frames – match existing door preparation.

D. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

E. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

F. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

G. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.
2. Furnish permanent cores to Owner for installation.

H. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

I. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

J. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

K. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

L. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

M. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

N. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.2 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

3.3 HARDWARE SCHEDULE

SET No. 1

Privacy Sets for Bedroom Doors

1 Latchset	CL Series Cylindrical	US26D	Arrow
	CL-02-5C-SC-26D-501		
3 Hinges	Standard weight mortise	US26D	Rockwood
1 Wall/Floor stop	409	US26D	Rockwood

SET No. 2

Passage Set for Single Closet Doors

1 Latchset	CL Series Cylindrical	US26D	Arrow
	CL-01-5C-SC-26D-502-511		
3 Hinges	Standard weight mortise	US26D	Rockwood

SET No. 3

Passage Set for Basement Entry Doors at Hatchways

1 Passage Set	9K Series Cylindrical	US26D	Best
	9K-3-0-N-14-3-STK-626		
3 Hinges	Specified in Section 08 1613		
1 Deadbolt Strike	Provide deadbolt strike with dust box.		
1 Deadbolt	E Series	US26D	Arrow

END OF SECTION 08 7100

SECTION 09 2900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Interior fire-rated gypsum board.
3. Exterior fire-rated gypsum board soffits.

B. RELATED SECTIONS:

1. 02 4119: Selective Demolition
2. 06 2023: Interior Finish Carpentry
3. 09 9000: Painting

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard

Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 99 percent.

B. Regional Materials: Gypsum panel products shall be manufactured in the United States within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

C. Regional Materials: Gypsum panel products shall be manufactured in the United States within 500 miles of Project site.

2.3 INTERIOR GYPSUM BOARD

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

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch.
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch.
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

E. Mold-resistant Gypsum Board ASTM C 1396/C 1396M

1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

F. Carport Soffits: USG Exterior Gypsum ceiling board; Firecode C

1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.

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

a. American Gypsum; Firebloc Type C.
b. CertainTeed Corp.; ProRoc Type C.
c. Georgia-Pacific Gypsum LLC; Fireguard C.
d. Lafarge North America Inc.; Firecheck Type C.
e. National Gypsum Company; Gold Bond Fire-Shield C.
f. USG Corporation; Firecode C Core.

2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
3. Long Edges: Tapered.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet. Plastic where indicated only.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized steel sheet.

C. Aluminum Trim: ASTM B 221, Alloy 6063-T5.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

D. Joint compound for exterior gypsum board; Fiberglass mesh joint tape with durabond compound.

2.7 AUXILIARY MATERIALS

A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

1. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content.

D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

E. Vapor Retarder: As specified in Section 072100 "Thermal Insulation."

2.8 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Polystyrene Aggregate Ceiling Finish: Water-based, job-mixed, polystyrene aggregate finish with flame-spread and smoke-developed indexes of not more than 25 when tested according to ASTM E 84.

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

a. Georgia-Pacific Gypsum LLC; ToughRock Ceiling Textures/Polystyrene.
b. National Gypsum Company; ProForm Perfect Spray.
c. USG Corporation; SHEETROCK Ceiling Spray Texture, QT.

C. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.

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

a. CertainTeed Corp.; ProRoc Wall and Ceiling Spray Texture.
b. Georgia-Pacific Gypsum LLC; ToughRock Ceiling Textures/Vermiculite.
c. USG Corporation; SHEETROCK Wall and Ceiling Spray Texture (Aggregated).

D. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.

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

    a. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
    b. National Gypsum Company; Perfect Spray EM Texture.
    c. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

    1. Aluminum Trim: Install in locations indicated on Drawings.

E. Prefill open joints rounded or beveled edges, and damaged surface areas.

F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

G. Inspect plywood/OSB subfloor and repair in accordance with Section 06160 – Sheathing.

H. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

    1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
    2. Level 2: Panels that are substrate for tile.
    3. Level 3: In Garage and Mechanical Rooms.
    4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

        a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

I. Texture Finish Application: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup, which is intended to match

existing conditions free of starved spots or other evidence of thin application or of application patterns.

J. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

K. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 09 2900

SECTION 09 6400 - WOOD FLOORING & REFINISHING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Replacement of existing damaged wood flooring.

B. Refinishing of existing wood flooring and stair treads.

PART 2 - PRODUCTS

2.1 WOOD FLOORING, GENERAL

A. Hardwood Flooring: Comply with NOFMA grading rules for species, grade, and cut.

1. Certification: Provide flooring that carries NOFMA grade stamp on each bundle or piece.

2.2 FIELD-FINISHED WOOD FLOORING

A. Solid-Wood Strip Flooring: Kiln dried and as follows:

1. Basis-of-Design Product: or a comparable product of one of the following:

a. Carlisle Wide Plank Floors.
b. EcoTimber.
c. International Hardwood Flooring, Inc.

2. Species and Grade: No. 1 Common red oak.
3. Cut: Plain sawn.
4. Thickness: 25/32 inch.
5. Face Width: 2-1/4 inches.
6. Lengths: Random-length strips complying with applicable grading rules.

B. Urethane Finish System: Complete water-based system of compatible components that is recommended by finish manufacturer for application indicated.

1. VOC Content:

a. Finish Coats and Floor Sealers: Not more than 350 g/L.
b. Stains: Not more than 250 g/L.

2. Low-Emitting Materials: Finish system materials shall comply with the testing and product requirements of the California Department of Health Services' "Standard

Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

3. Floor Sealer: Pliable, penetrating type.
4. Finish Coats: Formulated for multicoat application on wood flooring.

C. Wood Filler: Compatible with finish system and recommended by filler and finish manufacturers. If required to match approved samples, provide pigmented filler.

2.3 ACCESSORY MATERIALS

A. Asphalt-Saturated Felt: ASTM D 4869, Type II.

B. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines: Wood Flooring."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."

B. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 1/2 inch.

C. Vapor Retarder: Comply with NOFMA's "Installing Hardwood Flooring" for vapor retarder installation and the following:

1. Wood Flooring Nailed to Wood Subfloor: Install flooring over a layer of asphalt-saturated felt.
2. Wood Flooring Nailed to Sleepers over Concrete: Install flooring over a layer of polyethylene sheet with edges overlapped over sleepers and turned up behind baseboards.
3. Wood Flooring Installed Directly on Concrete: Install a layer of polyethylene sheet according to flooring manufacturer's written instructions.

D. Solid-Wood, Strip Flooring: Blind nail or staple flooring to substrate.

3.2 SANDING AND FINISHING

A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

B. Fill open-grained hardwood.

C. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.

1. Apply stains to achieve an even color distribution matching approved Samples.

3.3 PROTECTION

A. Remove and securely store surface applied hardware and fittings such as pipe escutcheons, carpet runner clips, and incidental floor- attached hardware that cannot be worked around or is likely to be damaged.

B. Seal room from adjacent spaces not scheduled for floor finishing by taping the perimeter of doors where threshold conditions permit or by sealing opening with plastic sheeting.

C. Protect all bare floors with Ram-board until the commencement of the floor finishing.

D. Make good any damage caused by failure to provide such protection.

1. Cleaning: Perform intermediate cleaning with solutions recommended by the coating manufacturer.

2. Environmental Conditions.

3. Perform all work with adequate ventilation and illumination.

4. Apply coatings only when surface and ambient temperature, humidity and airflow are within the coating manufacturer's recommended range.

5. Confirm that the moisture content of wood is within an acceptable range by using a recently calibrated moisture meter.

E. PREPARATION

1. Sand entire floor to bare wood as recommended in NOMA/MFMA Standards.

a. Pre-set existing and new face nails to a depth below the depth of sanding.

b. Protect base moldings from damage by power equipment.

c. Do not use steel wool in any phase of any operation.

d. Contain and control dust.

2. Fill nail holes, gouges splits and incidental voids.

3. Stain, where required to match original color.

4. Apply Seal coat consistent with system manufacturer's directions.

F. APPLICATION OF FINISH COATS

1. Apply coating consistent with the manufacturer's published directions but not less than one coat of floor sealer and three finish coats.

2. Maintain optimum environmental conditions to promote coating cure in least time.

3. Protect work area from dust.

3.4 PROTECTION

A. Protect all newly coated floors until they are completely dry. Curing periods shall exceed the manufacturer's recommended minimum time requirements. Protect with Ramboard or other similar durable material until Substantial Completion.

B. Do not use plastic sheet or film that might collect condensation, scrub finish, or cause a slipping hazard.

3.5 CLEANUP

A. Remove floor finishing products where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

B. Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

C. Remove combustible rubbish materials and empty cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

D. Clean equipment and dispose of wash water / solvents as well as all other cleaning and protective materials (e.g. rags, drop cloths, masking papers, etc.), thinners, strippers in accordance with the safety requirements of the Construction Manager.

END OF SECTION 09 6400

SECTION 09 6513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient molding accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

C. Samples for Initial Selection: For each type of product indicated.

D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Coordinate mockups in this Section with mockups specified in other Sections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Resilient base and stair accessories shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 THERMOPLASTIC-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Allstate Rubber Corp.
2. Armstrong World Industries, Inc.

3. Burke Mercer Flooring Products; a division of Burke Industries Inc.
4. Flexco.
5. Johnsonite; a Tarkett company.
6. Nora Systems, Inc.
7. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous)
2. Style and Location: Style B, Cove: Provide in areas with resilient flooring

C. Thickness: 0.125 inch.

D. Height: 4 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: As selected by Architect from full range of industry colors.

2.3 RUBBER MOLDING ACCESSORY

A. Description: Rubber nosing for resilient flooring, reducer strip for resilient flooring, joiner for tile and carpet.

B. Profile and Dimensions: As indicated.

C. Locations: Provide rubber molding accessories in areas indicated and at all flooring material height and resilient floor stair transitioning.

D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less and 60 g/L or less for rubber stair treads.

2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

    a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

    a. Miter or cope corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Stair Accessories:

1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
2. Tightly adhere to substrates throughout length of each piece.
3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 6513

SECTION 09 6519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. Resilient Tile Flooring
   2. Installation Accessories
      a. Adhesives
      b. Finishes & Cleaners

B. Related Requirements
   1. Section 01 7300, “Execution & Closeout Requirements”

1.02 SUBMITTALS

A. Product Data
   1. Technical Data
   2. Installation & Maintenance
   3. Warranty
   4. Reclamation Program
   5. Safety Data Sheets (SDS) for accessories
   6. Health Product Declaration (HPD) v2.0 and/or Declare Label

B. Selection Samples: Submit manufacturers complete set of color samples for Architect's initial selection.

C. Verification Samples: Submit two samples, 4 inches x 4 inches in size, illustrating color and pattern for each resilient flooring product specified.

1.03 QUALITY ASSURANCE

A. Comply with applicable laws and possess valid licenses, registrations, and/or certificates required by federal law, including but not limited to licenses, registrations, and/or certificates required to:
   1. Conduct business in the designated locale.
   2. Perform the contract work it seeks to perform.

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

C. Installer Qualifications: Professional-flooring contractors showing successful LVT installations in similar size and scope. Provide technical certifications, qualifications

and resources, including equipment, personnel and financial resources, to perform the referenced contract.

1.04 WARRANTY

A. Aspecta® Five Warranty - 25-Year Limited Non-Prorated Commercial Material Warranty.

Coverage includes:

1. 100% Cost of Material for the entire duration of Warranty (25 Years).
2. Pro-Rated Cost of Labor (Fair-Market Value) for the first 10 Years.
3. One-Time Transferability of Warranty.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check material for damage, and that the material is of the correct style, color, quantity and run number(s).

B. General Storage

1. Store all materials flat and off the floor in an acclimatized, weather-tight space between 65°-85°F.
2. Do not double stack pallets.

1.06 FIELD CONDITIONS

A. Acclimate material at jobsite between 65°-85°Fand 35%-85% RH for 48 hours prior to installation. Temperature and relative humidity should also be maintained at the same levels during installation, and after installation.

B. Spread unopened cartons no more than 6 cartons high and at least 4 inches apart.

C. Keep away from heating and cooling ducts and direct sunlight.

D. If permanent HVAC is not operational, temporary means should be used to maintain the recommended temperature and relative humidity levels.

E. Close areas to traffic during installation of flooring and accessories.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Aspecta® Five - Luxury Vinyl Plank & Tile; Metroflor Corporation 15 Oakwood Avenue, Norwalk, CT 06850.

B. Substitutions: Requests shall be submitted to and approved by the Architect.

2.02 RESILIENT TILE FLOORING

A. Physical Properties:

1. Construction: Solid Plank & Tile - Phthalate-Free, Formaldehyde-Free, and made from 100% Virgin Vinyl.
2. Wear Layer Thickness: 28mil.
3. Total Thickness (Gauge): 0.126 inch.
4. Finish: Urethane Coating with Ceramic Bead Particles.

B. Manufacturing, Performance, and Safety Standards

1. ASTM F1700, Classification - Class III, Type B.
2. ASTM F386, Thickness - Passes Requirements.
3. ASTM F410, Wear Layer Thickness - Passes Requirements for Commercial Classification.
4. ASTM F2421/F2055, Size & Squareness - Passes Requirements.
5. ASTM F1914, Residual Indentation - Surpasses Requirements.
6. ASTM F137, Flexibility - Surpasses Requirements.
7. ASTM F2199, Dimensional Stability - Surpasses Requirements.
8. ASTM F925, Chemical Resistance - Surpasses Requirements.
9. ASTM F1514, Resistance to Heat - Surpasses Requirements.
10. ASTM F1515, Resistance to Light - Surpasses Requirements.
11. ASTM E648 / NFPA 253, Critical Radiant Flux - Class I.
12. ASTM E662 / NFPA 258, Smoke Density (Flaming & Non-Flaming) - Passes Requirements.
13. CHPS/CA Section 01350 & ASTM D5116 - Passes Requirements.
14. ASTM F963, Sec. 4.3.5.2(2)(B), Heavy Metals - Passes Requirements.
15. ASTM D2047, Coefficient of Friction (Dry) - ≥0.6.
16. ASTM F970, Static Load Limit - ≥1,000 Lbs. (Surpasses Requirements).
17. ASTM D4060, Abrasion Resistance - Average of 30,000 cycles (Varies with Emboss).
18. ASTM D7823/CPSC-CH-C1001-09.3, Phthalates - Meets CPSIA Guidelines.
19. ASTM E90 & ASTM E413, Airborne Sound Transmission Loss - Sound Transmission Class (STC) 61.
20. ASTM E492 & ASTM E989, Impact Sound Transmission (Floor-Ceiling Assemblies) - Impact Insulation Class (IIC) 68.

C. Sustainability and Affiliations:

1. Product Sustainability:
    a. FloorScore® / CHPS 01350.
    b. VOC Content Limits: As specified in Section 01 6116.

c. NSF/ANSI 332 Platinum.

d. LEED v4 - Potential Contributions Towards Certification:

1) MR Prerequisite 2, Construction & Demolition Waste Management Planning.

2) MR Credit 2, Environmental Product Declarations (EPD).

3) MR Credit 4, Material Ingredients.

4) MR Credit 5, Construction & Demolition Waste Management.

5) EQ Credit 2, Low-Emitting Materials: Flooring Systems.

6) IN Credit 1, Innovation - Pilot Credit.

2. Affiliations - Manufacturer Member Bodies and/or Sponsorships:

a. ASTM International

b. Canada Green Building Council (CaGBC)

c. Flooring Contractors Association (FCICA)

d. Green Building Initiative (GBI)

e. Health Product Declaration Collaborative (HPDC)

f. International Interior Design Association (IIDA)

g. International Living Future Institute (ILFI)

h. Multilayer Flooring Association (MFA)

i. North American Association of Floor Covering Distributors (NAFCD)

j. Resilient Floor Covering Institute (RFCI)

k. Southface Energy Institute

l. U.S. Green Building Council (USGBC)

m. World Floor Covering Association (WFCA)

2.03 ACCESSORIES

A. Adhesives

1. Refer to the Aspecta® Five Installation Guide/Manual for the recommended Prevail® Adhesive(s) to use for installation.

2. Substitutions: Requests shall be submitted to and approved by the Architect in accordance with Section 01 2600.

3. Sustainability – The following qualifications are met by all Prevail® Adhesives recommended for use in the installation of Aspecta® Five, except when noted:

a. FloorScore® / CHPS 01350 / SCAQMD 1168.

b. VOC Content Limits.

B. Finishes & Cleaners

1. Refer to the Aspecta® Five Installation Guide/Manual for the recommended Prevail® Finishes & Cleaners.
2. Substitutions: Not permitted.
3. Sustainability
    a. CARB.
    b. VOC Content Limits.

PART 3 EXECUTION

3.01 EXECUTION:

A. Install flooring and accessories after other operations (including painting) have been completed.

B. Acceptance of Conditions: Carefully examine all installation areas with Installer/Applicator present, for compliance with requirements affecting Work performance.

1. Verify that field measurements, product, adhesives, substrates, surfaces, structural support, tolerances, levelness, temperature, humidity, moisture content level, pH, cleanliness and other conditions are as required by the manufacturer, and ready to receive Work.

C. Verify that substrate is contaminant-free (including old adhesives and abatement chemicals).

D. Test substrates as required by manufacturer to verify proper conditions exist.

1. Concrete:
    a. Check for concrete additives such as fly ash, curing compounds, hardeners, or other surface treatments that may prevent proper bonding of floor coverings.
    b. Moisture testing: Perform either the In-Situ Relative Humidity (RH) test (ASTM F2170) or Moisture Vapor Emission Rate (MVER) test (ASTM F1869). NOTE: Refer to the Manufacturer's Installation Guide/Manual for the maximum allowable substrate moisture content. Substrates above the maximum allowable moisture content will require a moisture mitigation system.
    c. Perform alkalinity testing per ASTM F710 to verify pH level is between 7 to 10.
    d. Check substrate for absorbency per manufacturer's recommendations.
    e. Perform bond testing per ASTM F710 to determine compatibility of adhesive to concrete substrate.
2. Wood:
    a. Shall be dry, clean, structurally sound and installed per underlayment manufacturer’s installation instructions.

b. Test wood subfloors and underlayment panels using a suitable wood moisture pin-meter. Readings between the subfloor and underlayment panels should be within 3% prior to installing the underlayment panels.

c. The maximum moisture content is 14%.

d. Proceed with installation only after satisfactory conditions have been met.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prior to installation, the flooring installer should plan and attend an on-site construction meeting with the General Contractor, Architect and Property Owner to review all requirements and inspect site conditions as outlined in the manufacturer's installation document, as well as to review the requirements of ASTM F710 and any relevant building codes, or local, state, or national regulations.

B. Flooring installation should not begin until all site conditions have been assessed, testing has been completed and subfloor conditions have been approved.

C. Prepare per manufacturer's written instructions:

1. Prepare substrates to ensure proper adhesion of Luxury Vinyl Plank & Tile.
2. Concrete Substrates: Prepare substrate per ASTM F710.
    a. Verify that subfloor is clean, flat, smooth, free of dirt, rust, paint, oil, wax or any contaminant that will interfere with adhesive bonding.
    b. Mechanically remove substrate coatings that are not compatible with adhesives, such as sealers, curing, hardening or parting compounds, soap, wax, oil, etc.
        1) Do not use solvents or adhesive removers.
    c. Expansion joints, isolation joints, or other moving joints must be honored and must not be filled with underlayment products or other materials, and floor coverings must not be laid over them. Expansion joint covering systems should be detailed by the architect or engineer and based upon intended usage and aesthetic considerations.
    d. Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities shall be filled or smoothed with high-quality Portland Cement or Calcium Aluminate based patching or underlayment compound for filling or smoothing, or both.
        1) Do NOT skim-coat large areas with patching compound, especially slick power-troweled surfaces.
        2) Sand smooth per manufacturer's instructions.
    e. Slick surfaces, such as power-troweled concrete, shall be profiled as needed to allow for a mechanical bond between the adhesive and subfloor.
        1) Do NOT use gypsum-based underlayment products and do not skim coat concrete subfloors.

f. Self-leveling underpayments: Provide a dry and smoothly-sanded underlayment substrate ready for installation of Luxury Vinyl Plank & Tile. Underlayment compound shall be moisture-resistant, mildew-resistant, and alkali-resistant and must have a minimum of 3,000 psi compressive strength or greater per ASTM C109/C109M.

g. Lightweight concrete shall have a compressive strength greater than 90lbs per cubic foot with minimum compression strength of 2,500 psi or greater.

3. Wood Substrates or Panel Type Underlayment:

a. Wood subfloors require an underlayment (double layer construction) with a minimum total thickness of 1 inch and minimum of 18 inches of well-ventilated space beneath.

1) Crawl spaces shall be insulated and protected by a vapor barrier.

b. Use minimum 0.25-inch-thick APA-rated “underlayment grade” plywood with a fully sanded face or other underlayment panel that is appropriate for the intended usage. Install and prepare panels and seams according to the manufacturer’s instructions.

4. Existing and other substrates:

a. Refer to manufacturer's professional installation guide and or contact manufacturer, as special conditions may exist.

3.03 INSTALLATION

A. Layout: to be determined by the Architect prior to beginning of installation

B. Installation per manufacturer’s written instructions, SECTION 01 7000, and as follows:

1. Follow layout and ensure installation reference lines are square.

2. Field tiles shall be installed with directional arrows on back aligned in the same direction or may be installed in quarter-turned fashion.

3. Check cartons for and do NOT mix dye lots.

4. Expansion joints: Locate expansion, isolation, and other moving joints prior to installation.

a. Do not fill expansion, isolation, and other moving joints with patching compound nor cover with resilient flooring.

5. Adhesives: Adhere flooring to substrate using the full spread method resulting in a completed installation without gaps, voids, raised edges, bubbles or any other surface imperfections.

a. Select appropriate adhesive, trowel and follow manufacturer's instructions.

b. Periodically spot-check transfer of adhesive to back of tile during installation.

c. Roll floor with a 100lbs. roller to ensure proper transfer of adhesive and bonding.

d. Protect floor from traffic per manufacturer's instructions.

e. Do not wet mop floor until the adhesive has properly set per written instructions.

3.04 FIELD QUALTITY CONTROL

1. Inspect flooring installation for non-conforming work, including (but not limited to) the following:
   a. Lack of adhesion.
   b. Bubbles, loose tiles or raised edges.
   c. Dirt and debris underneath flooring.
   d. Excessive gaps.
   e. Improper substrate preparation (as indicated by telegraphing).
   f. Damage to tiles, including dents/indentations, cuts, cracks, burns or punctures.

B. Non-conforming work per General Conditions and as follows:
   1. Repair or replace damaged material if not acceptable to the Architect.

3.05 CLEANING

A. Waste Management as follows:
   1. Coordinate material reclamation program with manufacturer, if applicable.
      a. Store and return cartons and pallets to manufacturer or recycler for reuse or recycling.

B. Provide Progress Cleaning per manufacturer's written instructions, SECTION 01700, and as follows:
   1. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work.
      a. Clean and protect completed construction until Substantial Completion.
      b. During installation, remove wet adhesive from surface of flooring per manufacturer's instructions.
   2. Site: Maintain project site free of waste materials and debris.
   1. Protection: Remove manufacturer's and other installed protection immediately prior to Substantial Completion inspection, unless required otherwise.
   2. Clean floor with a neutral 6-8 pH cleaner.

3.06 MAINTENANCE

A. Initial maintenance per flooring manufacturer’s written instructions and as follows:
   1. Allow the adhesive to cure for at least 48 hours prior to wet cleaning the floor.
   2. Sweep, dust mop or vacuum the floor thoroughly to remove all loose dirt, dust, grit and debris. Do not use vacuums with a beater bar assembly.

3. Remove any dried adhesive residue from the surface with mineral spirits applied to a clean, lint-free cloth.
4. Damp mop the floor using a Cleaner recommended by the flooring Manufacturer.
5. If necessary, scrub the floor using an auto scrubber or rotary machine (300 rpm or less) with a Cleaner recommended by the flooring Manufacturer... using the proper dilution ratio and the appropriate scrubbing brush or pad.
6. Thoroughly rinse the entire floor with fresh, clean water. Remove the dirty residue with a wet-vacuum or clean mop and allow the floor to dry completely.

3.07 PROTECTION

A. Protect materials from construction operations until date of Final Completion or Owner occupancy, whichever occurs first.
   1. Protect finished floor from abuse and damage by using heavy, non-staining kraft paper, drop cloths, or equivalent. Use additional, non-damaging protective materials, as needed.
   2. Light foot traffic on a newly installed floor can be permitted after 24 hours.
   3. Keep heavy traffic and rolling loads off the newly installed LVT flooring for 48 hours. Protect the floor from rolling loads by covering with protective boards.

END OF SECTION 09 6519

SECTION 09 9000 - RESIDENTIAL PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 RELATED SECTIONS

A. Section 06 6023 – “Interior Rough Carpentry”

B. Section 08 1400 – “Flush Wood Doors”

C. Section 09 2900 – “Gypsum Board”

1.3 REFERENCES

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

B. US Green Building Council, (USGBC) - Green Seal standards for LEED paint credits.

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

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

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

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

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

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

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

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

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

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

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

1.4 DEFINITIONS

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

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

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

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

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

F. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet the following OTC limits for VOC's.
   1. Interior flat paints: 100 grams per liter or less, per gallon.
   2. Interior enamels: 150 grams per liter or less, per gallon.
   3. Interior stains: 250 grams per liter or less, per gallon.
   4. Interior primers: 200 grams per liter or less, per gallon.
   5. Rust preventive coatings: 400 grams per liter or less, per gallon.
   6. Dry fog coatings: 400 grams per liter or less, per gallon.
   7. Floor coatings: 250 grams per liter or less, per gallon.

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

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

I. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.
   1. Flat - Less than 5 Percent.
   2. Eggshell - 5 - 20 Percent.
   3. Satin - 20 - 35 Percent.
   4. Semi-Gloss - 30 - 65 Percent.
   5. Gloss - Over 65 Percent.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 3300 – “Submittal Procedures”

B. Product Data: Provide a complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general

product category.
2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.

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

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

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

1.6 QUALITY ASSURANCE

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

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

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Mock-up areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Approved mock-up areas will serve as the standard for remaining Work.
4. Refinish mock-up area as required to produce acceptable Work.

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.

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

1.8 PROJECT CONDITIONS

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

1.9 WARRANTY

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

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

1.10 EXTRA MATERIALS

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

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Product: Subject to compliance with requirements, provide Behr Process Corporation;

B. Regardless of selected manufacturer, colors shall match the specified Behr paint color. Acceptable manufacturers include

1. Benjamin Moore
2. Sherwin Williams

2.2 MATERIALS - GENERAL

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

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

2.3 MIXING AND TINTING

A. Except where specifically noted in this section, all paint shall be ready-mixed and

pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.

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

2.4 INTERIOR PAINT SYSTEMS

A. DRYWALL

Gypsum Board Walls & Ceilings – Color to match existing, subject to review.

1. Eggshell System:
    1) Prime Coat: Primer sealer, latex, interior: Kilz 2 Latex Int/Ext Water-Based Primer 22001.
    2) Intermediate Coat: Latex, interior, matching topcoat
    3) Topcoat: Latex, interior (MPI Gloss Level 3)

B. WOOD

Doors, Jambs, and Window Sills– Color to match existing, subject to review.

1. Semi-Gloss System:
    1) Prime Coat: Primer sealer, latex, interior: Kilz 2 Latex Int/Ext Water-Based Primer 22001.
    2) Intermediate Coat: Latex, interior, matching topcoat
    3) Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5 Behr Premium Plus Interior Semi-Gloss Enamel 3050:

Stair Risers and Stringer – Behr Antique Penny #S270-7.

1. Interior Acrylic Satin System:
    1) Prime Coat: Primer, latex, for interior wood: Kilz 2 Latex Int/Ext Water-Based Primer 22001.
    2) Topcoat: Acrylic Porch & Floor Enamel (MPI Gloss Level 5)
    3) For Stair Tread refinishing see Section 09 9450 “Wood Flooring Re-Finishing”

C. METALS

1. Institutional Low-Odor/VOC Latex System MPI INT 5.1S:
    1) Prime Coat: Primer, rust inhibitive, water based MPI #107.
    2) Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat
    3) Topcoat: Latex, interior, institutional low odor/VOC, match color and gloss of surface being repainted

2.5 EXTERIOR PAINT SYSTEMS

A. WOOD: Siding, Trim, Shutters, Sashes, Hardboard-Bare/Primed, Gypsum-board soffits.

1. Latex over Latex Primer System MPI EXT 6.3L:

a. Satin Finish:

1) Prime Coat: Primer, latex for exterior wood, MPI #6; Behr Premium Plus® Interior / Exterior Multi-Surface Primer & Sealer 436, MPI #6.
2) Intermediate Coat: Latex, exterior, matching topcoat.
3) Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15: Behr Premium Plus® Exterior Semi-Gloss Enamel 5050 .

B. ARCHITECTURAL PVC, PLASTIC, FIBERGLASS

1. Latex System Plastic Trim Fabrication Substrates:

a. Semi-Gloss:

1) Prime Coat: Primer, bonding, water based, MPI #17: Kilz® Adhesion Int/Ext Bonding Primer L2111, MPI #17.
2) Intermediate Coat: Latex, exterior, matching topcoat.
3) Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11: Behr Pro™ e600 Exterior Semi-Gloss PR670, MPI #11 .

PART 3 EXECUTION

3.1 EXAMINATION

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

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

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

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

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

F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.
1. Concrete and Masonry: 3-5 percent. Allow new concrete to cure a minimum of 28 days.
2. Exterior Wood: 17 percent.
3. Interior Wood: 15 percent.

4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
5. Plaster and Gypsum: 15 percent.
6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.

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

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

3.2 PREPARATION - GENERAL

A. Clean surfaces thoroughly prior to coating application.

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

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

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

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

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

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

H. Protect adjacent surfaces not indicated to receive coatings.

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

3.3 SURFACE PREPARATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.4 APPLICATION - GENERAL

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

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

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

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

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

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

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

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

3.5 CLEANING

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

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

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

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

E. Remove protective materials.

3.6 PROTECTION AND REPAIR

A. Protect completed coating applications from damage by subsequent construction activities.

B. Repair to Architect's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Architect's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

END OF SECTION 09 9000

SECTION 12 2113 - LOUVER BLINDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors and/or suppliers providing goods or services referenced in or related to this Section shall also be bound by the Documents identified in Division 1 Section “Summary”, Paragraph 1.1A, entitled “Related Documents.”

1.2 SUMMARY

A. This Section includes the following:

1. Horizontal louver blinds for all exterior windows.
2. Vertical louver blinds for sliding glass doors.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.

C. Samples for Initial Selection: For each type and color of horizontal louver blind indicated.

1. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For each type and color of horizontal louver blind indicated.

1. Slat: Not less than 12 inches long.
2. Blind: One full functional unit, 16-inches wide by 24-inches long.

E. Product Certificates: For each type of horizontal louver blind, signed by product manufacturer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of horizontal louver blind.

G. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain horizontal louver blinds through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide horizontal louver blinds with the fire-test-

response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Flame-Resistance Ratings: Passes NFPA 701.

C. Product Standard: Provide horizontal louver blinds complying with WCSC A 100.1.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver horizontal louver blinds in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

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

1. Hunter Douglas; Lightlines.
2. Levolor, a Newell Rubbermaid Company; Riviera.
3. Springs Window Fashions Division, Inc.; Bali Classics.

B. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile.

1. Width: 1 inch (0.991- inch actual).

a. Spacing: Not less than 0.85 inch.

2. Thickness: Not less than 0.008 inch.

3. Finish: One color.

a. Ionized Coating: Antistatic, dust-repellent, baked polyester finish.

C. Headrail: Formed steel channel, “U”-shaped; long edges returned or rolled; fully enclosing operating mechanisms on three sides and the following:

1. Capacity: One blind per headrail.
2. Size: 1-inch high by 1-1/2- inch deep, 0.025 inch thick.
3. Provide steel end stiffeners at each end of headrail with a lateral adjustment tab to eliminate lateral movement and the center the blind in the window.
4. Hardware: Acetal low friction thermoplastic, mechanically locked into head channel by means of snap-in fittings with no mechanical cleats visible from underside of headrail.
5. Finish: Prime coat of vinyl primer with finish coat of polyester baked enamel, to match bottom rail and end support brackets.

D. Bottom Rail: Formed-steel tube 0.025 inch thick, with plastic or metal capped ends, top contoured to match crowned shape of slat; with enclosed ladders and tapes to prevent contact with sill; and locking groove to receive dust cover.

1. Finish: Prime coat of vinyl primer with finish coat of polyester baked enamel.

E. Ladders: Braided string; 100% high tenacity polyester yarn, not less than 0.045- inch diameter or greater than 0.066- inch diameter.

1. Spacing: Distance between end ladder and end of slats not to exceed 6-1/2 inches; distance between ladders not to exceed 24 inches.
2. Ladder drum: Injection molded thermoplastic with smooth hole edges to position ladder. Secure ladder with a snap down top, eliminating the need for braided ladder clips.

F. Lift Cords: Manufacturer's standard; braided with polyester jacket and center core, 1.4 mm, securely anchored to bottom rail with provision to detach cords.

1. Equip lift cords with plastic tassels.

G. Tilt Control: Enclosed worm-gear mechanism, slip clutch or detachable wand preventing overrotation, and linkage rod, and the following:

1. Tilt Operation: Manual.
2. Wand: Detachable, clear polycarbonate hollow rod with a hexagonal shape measuring approximately 1/4- inch across.
3. Length of Tilt Control: Length required to make operation convenient from floor level.
4. Tilt: Full.

5. Tilt Rod: Electro-zinc coated solid steel, hexagonal in shape, 1/4-inch at its widest point. Tilt rod to limit torsional deflection to 6 degrees in a 30-inch test length with a torque application of one-foot pound.
6. Tilt Rod Support: Acetal low friction thermoplastic, to provide smooth bearing and center the ladder drum over ladder hole. Incorporate a grommet guide to guide lift cord and braided ladder through bottom of headrail. Provide acetal grommet with beveled edges to prevent cord and braided ladder wear and discoloration.

H. Lift Operation: Manual, cord lock; locks pull cord to stop blind at any position in ascending or descending travel.

1. Cord Lock: Snap-in design which incorporates a stainless-steel wear guard over which cords pass, and a floating shaft-type locking pin. Locking pin shall be free of abrasive teeth and offer minimum wear to cord. Incorporate a crash-proof safety feature which will lock blind automatically upon release of cord.
2. Cord Guide: Nickel steel plated.

I. Tilt-Control and Cord-Lock Position: Right and left side of headrail, respectively.

J. Mounting: Wall or ceiling mounting as required, permitting easy removal and replacement without damaging blind or adjacent surfaces and finishes; with spacers and shims required for blind placement and alignment indicated.

1. Provide intermediate support brackets if end support spacing exceeds spacing recommended by manufacturer for weight and size of blind, but not more than 48-inches.

K. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard; provide at locations indicated.

L. Colors, Textures, Patterns, and Gloss: As selected by Architect from manufacturer's full range.

2.2 HORIZONTAL LOUVER BLINDS

A. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.

B. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:

1. Blind Units Installed between (inside) Jambs: Width equal to 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch, less than jamb-to-jamb dimension of opening in which each blind is installed. Length equal to 1/4 inch, plus or minus 1/8 inch, less than head-to-sill dimension of opening in which each blind is installed.

2. Blind Units Installed outside Jambs: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, and operating hardware, and for hardware position and blind mounting method indicated.

1. Fabricate from steel, marked left and right to facilitate installation, with 1-1/4-inch extra wide top to accommodate power screwdriver.
2. Finish: Prime coat of vinyl primer with finish coat of polyester baked enamel, to match headrail.

D. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

E. Color-Coated Finish:

1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

F. Component Color: Provide rails, cords, ladders, and exposed-to-view metal, and plastic matching or coordinating with slat color, unless otherwise indicated.

2.3 VERTICAL LOUVER BLINDS

A. Rail System: Headrail.

1. Rails: Manufacturer's standard; long edges returned or rolled; channel-shaped, enclosing operating mechanisms

B. PVC Vanes: Extruded PVC (vinyl), UV-stabilized and integrally colored.

1. Openness Factor: 3 percent
2. Fabric Inserts: As selected from manufacturer's full range.
3. Fabric Vanes: Manufacturer's standard fabric.
4. Nominal Vane Width: 3-1/2 inches.
5. Vane Direction Control: Manual with wand.
6. Traversing Control: Manual with wand

C. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, and operating hardware, and for hardware position and blind mounting method indicated.

D. Color-Coated Finish:

1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

E. Component Color: Provide rails, cords, ladders, and exposed-to-view metal, and plastic matching or coordinating with slat color, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions, and located so exterior slat edges in any position are not closer than 1 inch to interior face of glass. Install intermediate support as required to prevent deflection in headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware if any.

B. Flush Mounted: Install horizontal louver blinds with slat edges flush with finish face of opening if slats are tilted open.

C. Jamb Mounted: Install headrail flush with face of opening jamb and head.

D. Head Mounted: Install headrail on face of opening head.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate smoothly, easily, safely, and free of binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems. Refer to Division 1 Section "Demonstration and Training."

END OF SECTION 12 2113

APPENDIX A – SAMPLE DOCUMENTS All sample documents are included herein as exhibits. Actual documents can be found on ECC Cobblestone. Actual forms must be downloaded at the time of use to ensure latest versions.

G702 - APPLICATION & CERTIFICATE FOR PAYMENT

G703 - CONTINUATION SHEET

REQUISITION CHECKLIST

UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

CONTRACTOR'S CHANGE ORDER PROPOSAL

CHANGE ORDER LABOR WORKSHEET

CHANGE ORDER MATERIAL WORKSHEET

CHANGE ORDER EQUIPMENT EXPENSE PROPOSAL

CHANGE ORDER UNIT PRICE WORKSHEET

AIA® Document G702® – 1992

Application and Certificate for Payment

TO OWNER:

PROJECT:

APPLICATION NO:

PERIOD TO:

CONTRACT FOR:

CONTRACT DATE:

PROJECT NOS: / /

Distribution to:
OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
FIELD ☐
OTHER ☐

FROM CONTRACTOR:

VIA ARCHITECT:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703®, Continuation Sheet, is attached.

1. **ORIGINAL CONTRACT SUM** ..... $ _____
2. **NET CHANGE BY CHANGE ORDERS** ..... $ _____
3. **CONTRACT SUM TO DATE** *(Line 1 ± 2)* ..... $ _____
4. **TOTAL COMPLETED & STORED TO DATE** *(Column G on G703)* ..... $ _____
5. **RETAINAGE:**
   a. _____% of Completed Work
   (Columns D + E on G703) $ _____
   b. _____% of Stored Material
   (Column F on G703) $ _____

   Total Retainage *(Lines 5a + 5b, or Total in Column I of G703)*..... $ _____
6. **TOTAL EARNED LESS RETAINAGE** ..... $ _____
   (Line 4 minus Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT** ..... $ _____
   (Line 6 from prior Certificate)
8. **CURRENT PAYMENT DUE** ..... $
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 minus Line 6) $ _____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month	$	$
TOTAL	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $ _____

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certificate for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED *(Not in D or E)*	TOTAL COMPLETED AND STORED TO DATE *(D+E+F)*	% *(G ÷ C)*	BALANCE TO FINISH *(C – G)*	RETAINAGE *(If variable rate)*
			FROM PREVIOUS APPLICATION *(D + E)*	THIS PERIOD					
	GRAND TOTAL								

ELM CITY communities
Housing Authority of New Haven

REQUISITION CHECKLIST 2012

DATE: _____ **REQUISITION #:** _____(PROGRESS / FINAL)
CONTRACT # : _____
PO#: _____
PROJECT NAME: _____
CONTRACTOR: _____

_____ ☐ **DRAW REQUEST**, original, fully executed with General Contractor's signature notarized:
- ☐ **AIA G702**-APPLICATION & CERTIFICATION FOR PAYMENT
- ☐ **AIA G703**-CONTINUATION SHEET(S)

_____ ☐ **AIA G701** CHANGE ORDER(S) signed by all appropriate parties (Construction Contract Changes)

_____ ☐ **SCHEDULE D**-HANH Subcontractor/Major Supplier Report *(SUBMIT MONTHLY)*

_____ ☐ **HUD FORM 60002** *(SUBMIT MONTHLY FOR PRIME & EACH SUBCONTRACTOR--LABEL FINALS)*

_____ ☐ **CONTRACTOR / VENDOR WORKFORCE ANALYSIS** *(SUBMIT MONTHLY)*

_____ ☐ **SECTION 3 NEW HIRE REPORT** *(SUBMIT MONTHLY)*

_____ ☐ **UNCONDITIONAL WAIVERS** *(Certifying that you have been paid)* , original and executed *(Specify PROGRESS or FINAL)*
- ☐ Prime Contractor Unconditional Waiver
- ☐ Subcontractor Unconditional Waiver *(Submit for each active subcontractor)*

_____ ☐ **CONDITIONAL WAIVERS**, original and executed *(Specify PROGRESS or FINAL)*
- ☐ Contractor Conditional Waiver
- ☐ Subcontractor Conditional Waiver *(Submit for each active subcontractor)*

_____ ☐ **LIEN WAIVER SUMMARY**, original and executed *(See sample)*

_____ ☐ **STORED MATERIALS**
- ☐ Invoices
- ☐ Evidence of Insurance Coverage
- ☐ Copy of Warehouse Agreement *(if stored materials are offsite)*

_____ ☐ **CERTIFIED PAYROLLS**: PRIME & SUBCONTRACTORS *(Label Final CP's)*

_____ ☐ **CONSTRUCTION/MODERNIZATION SELF INSPECTION FORM** *(HANH completes)*

EXPLANATION:_____

_____

_____

This form is the cover page for all Requisition Requests. Check appropriate boxes for items included in your package. If an item is not applicable, indicate this by noting "N/A" on the line next to that item. If the package is not complete as submitted, it shall not be processed. provide an explanation as to why and the date we can anticipate receipt of that item on the lines provided above.

5/23/2012 hsh

PROJECT MANAGER APPROVAL _____

Unconditional Waiver and Release Upon Progress Payment

Use this form when the claimant is required to execute a waiver and release in exchange for or in order to induce payment of a progress payment and the claimant asserts in the waiver that he or she has in fact been paid the progress payment. This release does not cover all items. See the "Unconditional Waiver and Release Upon Progress Payment" form for more information.

UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

The undersigned has been paid and has received a progress payment in the sum of $_____

for labor, services, equipment or material furnished to _____
YOUR CUSTOMER

on the job of _____ located at _____
OWNER JOB DESCRIPTION

and does hereby release any mechanic's lien, stop notice or bond right that the undersigned has on the above referenced job to the following extent.

This release covers a progress payment for labor, services, equipment, or material furnished to

_____ through _____
YOUR CUSTOMER DATE

only and does not cover any retentions retained before or after the release date; extras furnished before the release date for which payment has not been received; extras or items furnished after the release date. Rights based upon work performed or items furnished under a written change order which has been fully executed by the parties prior to the release date are covered by this release unless specifically reserved by the claimant in this release. This release of any mechanic's lien, stop notice, or bond right shall not otherwise affect the contract rights, including rights between parties to the contract based upon a rescission, abandonment, or breach of the contract, or the right of the undersigned to recover compensation for furnished labor, services, equipment, or material covered by this release if that furnished labor, services, equipment, or material was not compensated by the progress payment.

Dated: _____ _____
COMPANY NAME

By: _____
TITLE

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL RELEASE FORM.

Conditional Waiver and Release Upon Progress Payment

Use this form when the claimant is required to execute a waiver and release in exchange for or in order to induce the payment of a progress payment and the claimant has not been paid. This form is useful when the claimant has not been paid yet, but will be paid out of a progress payment that is not the final payment. This conditional waiver and release is only effective if the claimant is actually paid. This release does not cover all items. See the "Conditional Waiver and Release Upon Progress Payment" form for more information.

CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

Upon receipt by the undersigned of a check from _____
MAKER OF CHECK

in the sum of $_____ payable to _____
AMOUNT OF CHECK PAYEE OR PAYEES OF CHECK

and when the check has been properly endorsed and has been paid by the bank upon which it is drawn, this document shall become effective to release any mechanic's lien, stop notice, or bond right, the undersigned has on the job of _____
OWNER

located at _____
JOB DESCRIPTION

to the following extent. This release covers a progress payment for labor, services, equipment, or

material furnished to _____ through _____
YOUR CUSTOMER DATE

only and does not cover any retentions retained before or after the release date; extras furnished before the release date for which payment has not been received; extras or items furnished after the release date. Rights based upon work performed or items furnished under a written change order which has been fully executed by the parties prior to the release date are covered by this release unless specifically reserved by the claimant in this release. This release of any mechanic's lien, stop notice, or bond right shall not otherwise affect the contract rights, including rights between parties to the contract based upon a rescission, abandonment, or breach of the contract, or the right of the undersigned to recover compensation for furnished labor, services, equipment, or material covered by this release if that furnished labor, services, equipment was not compensated by the progress payment.

Before any recipient of this document relies on it, said party should verify evidence of payment to the undersigned.

Dated: _____ _____
COMPANY

By:_____
TITLE

Unconditional Waiver and Release Upon Final Payment

Use this form when the claimant is required to execute a waiver and release in exchange for, or in order to induce payment of, a final payment and the claimant asserts in the waiver he or she has in fact been paid the final payment.

UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

The undersigned has been paid in full for all labor, services, equipment or material furnished to

_____ on the job of _____
YOUR CUSTOMER OWNER

located at _____ and does hereby waive and release any
JOB DESCRIPTION

right to a mechanic's lien, stop notice, or any right against a labor and material bond on the job, except for disputed claims for extra work in the amount of $_____.

Dated: _____ _____
COMPANY NAME

By: _____
TITLE

Conditional Waiver and Release Upon Final Payment

Use this form when the claimant is required to execute a waiver and release in exchange for or in order to induce the payment of a final payment and the claimant has not been paid. This release is only binding if there is evidence of payment to the claimant. Evidence of payment may be demonstrated by:

- the claimant's endorsement on a single check or a joint payee check which has been paid by the bank upon which it was drawn; or
- written acknowledgment of payment given by the claimant.

CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

Upon receipt by the undersigned of a check from _____
MAKER OF CHECK

in the sum of $_____ payable to _____
AMOUNT OF CHECK PAYEE OR PAYEES OF CHECK

and when the check has been properly endorsed and has been paid by the bank upon which it is drawn, this document shall become effective to release any mechanic's lien, stop notice, or bond right the undersigned has on the job of _____
OWNER

located at _____
JOB DESCRIPTION

This release covers the final payment to the undersigned for all labor, services, equipment, or material furnished on the job, except for disputed claims for additional work in the amount of $_____.
Before any recipient of this document relies on it, the party should verify evidence of payment to the undersigned.

Dated: _____ _____
COMPANY NAME

By: _____
TITLE

Elm City Communities/ Housing Authority New Haven/ Glendower Group
360 Orange Street
New Haven, CT 06511

Contract No. _____
Project No. _____
Change Request No. _____

CONTRACTOR'S CHANGE ORDER PROPOSAL

Contractor Name: _____ Date: _____
Address: _____
_____
Telephone No.: _____

Allowance
Change Order

				HANH REVISIONS
SECTION A:	**CONTRACTOR WORK**			
	1. Total Contractor Labor (from Labor Worksheet)		$0.00	
	2. Total Contractor Material (from Material Worksheet)		$0.00	
	3. Total Contractor Equipment (from Equipment Expense Proposal)		$0.00	
	4 SUBTOTAL (total lines 1 through 3)		$0.00	
	5 Premium Portion of Overtime (from Labor Worksheet)		$0.00	
	6 Under Special conditions as permitted by Owner: Gen.Conditions up to 6%		$0.00	
	7 Contractor's Markup Combined Overhead and Profit (% of line 4)		$0.00	
	8 CONTRACTOR TOTAL (Total lines 4, 5, 6 and 7)		**$0.00**	
SECTION B:	**SUBCONTRACTOR WORK**	***(From Subcontractor's Proposal - Use a separate form for each Sub)***		
	9. Names of Subcontractors:	**Base Cost Only (Line D3)**	**up to 8% Markup (Line D4)**	
	A. _____	$0.00	$0.00	
	B. _____	$0.00	$0.00	
	C. _____	$0.00	$0.00	
	D. _____	$0.00	$0.00	
	10. TOTAL SUBCONTRACTORS' PROPOSALS	$0.00	$0.00	
	11. CM's/G Contractor's Markup on Subs' Cost (per Contract):			
	11a. Overhead up to 2%		$0.00	
	11b. Profit, Up to 6%		$0.00	
	11c.		$0.00	
	12. Subcontractors' Premium Portion of approved Overtime		$0.00	
	13. SUBCONTRACTOR TOTAL		$0.00	
SECTION C:	**TOTAL CONTRACTED UNIT PRICE COSTS (from Unit Price Worksheet)**	**14.**	**$0.00**	
SECTION D:	**CONTRACTOR'S REQUESTED TOTAL**		**Round Totals to Nearest Dollar**	
	15. **AMOUNT REQUESTED**	*(Total lines 8,13, and 14.)*	**$0.00**	

_____
Signature of Contractor's Authorized Representative Date

_____ _____
Print Name Print name of Contact Person *(if different)*

_____ _____
Print Title Phone No. *(if different from above)*

SECTION E: CONSTRUCTION MANAGER'S/A/E REVIEW

I have reviewed the labor hours, material quantities and equipment and
no exceptions are taken to the Proposal.
see comments noted on proposal or below: _____
_____
_____

By: _____ _____ _____
Construction Manager/A/E Date Phone No.

_____ _____
Project Manager

_____ _____
Construction Officer

Credit Change Order Payment Lines Affected

Line	Amount	Line	Amount	Line	Amount

Housing Authority of the City of New Haven
360 Orange Street
New Haven CT 06511

Contract No. ____
Project No. ____
Change Request No. 1

CHANGE ORDER LABOR WORKSHEET

Contractor Name: ____ Date: ____
Address: ____
____
Telephone No.: ____

STRAIGHT TIME LABOR AND PREMIUM PORTION OF OVERTIME (PPO)								HANH USE ONLY	
Work Description	Trade	Straight Time Hours	Straight Time Rate	Overtime Hours	Overtime Rate	Straight Time Cost	PPO Cost	HANH Revisions	
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
						$0.00	$0.00		
					SUBTOTALS	$0.00	$0.00		
					TOTAL LABOR		**$0.00**		

Housing Authority of the City of New Haven
360 Orange Street
New Haven, CT 06511

Contract No. ______
Project No. ______
Change Request No. ______

CHANGE ORDER MATERIAL WORKSHEET

Contractor N ______ Date: ______
Address: ______
______
Telephone N ______

					HANH USE ONLY	
Material Description	Quantity	Unit	Unit Cost	Material Cost	HANH Revisions	
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
				$0.00		
(Total from additional Material Worksheets, if required.)				$0.00		
TOTAL MATERIAL				**$0.00**		

Housing Authority of City of New Haven
360 Orange Street
New Haven, CT 06511

Contract Number
Project Number
Change Request No.

Contract Number
Project Number
Change Request No.

CHANGE ORDER EQUIPMENT EXPENSE PROPOSAL

Contractor Name:
Address:
Telephone Number:

Page Number: 1 of 1

Date:

1. For **self-owned** equipment calculate rate in column 6.
2. **Rented** equipment will be paid for at actual cost. Complete columns 1, 3, 4 and 11.
   Include a copy of the rental invoice or quote verified with the signature of the HANH Project Manager.
3. Operating cost includes fuel and lubricants but does not include operator's wages.
4. Minor equipment and hand tools are considered overhead costs and cannot be claimed.

Comments:

1	2	3	4	5	6	7	8	9	10	11
Indicate if Owned or Rented	Refer-ence Page from Blue Book	**Complete Equipment Description** Year, Make, Complete Model No., Size, Capacity, H.P., GWV, Fuel Type used or other information to completely describe the equipment used.	Hours Required on Site	Monthly Rate	Hourly Rate *Column 5 divided by 176 Hrs./Month*	Equipment Expense *Column 4 multiplied by Column 6*	Actual Operating Hours	Hourly Operating Cost *Rate from Blue Book*	Total Operating Cost *Column 8 multiplied by Column 9*	**Total Equipment Cost** *Sum of Column 7 and Column 10 or Total Rental Cost*
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
					$0.00	$0.00			$0.00	
TOTAL CONTRACTOR EQUIPMENT EXPENSE									*Carry forward to Contractor's Proposal or Subcontractor's Proposal*	**$0.00**

Elm City Communities/ HOUSING AUTHORITY NEW HAVEN/ Glendower Group
360 ORANGE STREET
NEW HAVEN, CT 06511

Contract Number
Project Number
Change Request No.

UNIT PRICE WORKSHEET

Contractor Name:
Address:
Telephone Number:

Page Number: 1 of 1

Date:

FOR UNIT PRICES SPECIFIED IN THE CONTRACT DOCUMENTS

Spec. Section	Description	Quantity	Unit	Unit Cost	Total Cost
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
A. TOTAL CONTRACT UNIT PRICE COSTS	For Contractor Work or Subcontractor Work carry forward to Contractor's Proposal, Section C.				**$0.00**

APPENDIX B - NOISE CONTROL

Title.

This article shall be known as the "Noise Control Ordinances."

Purpose.

It is recognized that people have a right to and should be ensured an environment free from excessive sound and vibration that may jeopardize their health, safety, welfare, or quality of life. This chapter is enacted to protect, preserve and promote these values for the citizens of New Haven through the reduction, control and prevention of unlawfully excessive noise.

Definitions.

The following definitions shall apply in the interpretation and enforcement of this article:

Ambient noise or background noise means a noise of a measurable intensity which exists at a point as a result of a combination of many distant individually indistinguishable sources. In statistical terms, it is the level which is exceeded ninety percent (90%) of the time (L90) in which the measurement is taken.

Collection means the act of picking up refuse at its point of generation or storage, placing it in a vehicle and completing the process at each location.

Commercial zone means all commercial districts and business districts, including BA, BB, BC, BD, BD-1 and BE as defined in the zoning regulations of the City of New Haven, and all uses associated therewith permitted either as a right or as a special use.

Compression release type braking system means any device equipped on certain commercial vehicles, including but not limited to, tractors, semi-trucks, motor carriers and buses that utilize engine compression release or engine retardants as a means of slowing or braking the speed of the vehicle in lieu of applying the clutch or brakes.
These devices are also known as Jake brakes.

Construction means any site preparation, assembly, erection, substantial repair, alteration or similar action for or of public or private rights-of-way, structures, utilities or similar property. This term does not encompass demolitions.

Construction equipment means any equipment or device operated by fuel, electric power, air or hydraulic pressure, used in construction or demolition work.

Daytime hours means the hours between 7:00 a.m. and 10:00 p.m. Mondays through Saturdays, and the hours of 9:00 a.m. through 9:00 p.m. Sundays and federal and state holidays. Unless otherwise provided, all other hours shall be

construed as nighttime hours.

Decibel means a logarithmic unit of measure used in measuring magnitudes of sound. The symbol is dB. SPL (sound-pressure level) is defined as:
SPL = 20 log P in dB/Po
Where Po = 0.0002 microbars

Demolition means any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces or similar property.

Domestic power equipment means power saws, drills, grinders, lawn and garden tools and other similar devices.

Emergency means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action.

Emergency vehicle means any motor vehicle authorized by Connecticut General Statutes sect. 14-283 as amended from time to time and the City of New Haven to have sound- warning devices such as sirens and bells which can lawfully be used when responding to an emergency.

Emergency work means work made necessary to restore property to a safe condition following an emergency, or work required to protect persons or property from exposure to imminent danger.

Impulse noise means a sound of short duration, usually less than one (1) second, with an abrupt onset and rapid decay.

Industrial zone means all industrial districts as defined by the zoning regulations of the City of New Haven, including but not limited to IL, Th1 and Ill Districts.

Loud amplification device or similar equipment shall include, but not be limited to, a radio, television, stereo, record player, tape player, cassette player, compact disc player, loud speaker or sound amplifier which is operated in such manner that it creates noise.

Motor vehicle is defined as per Section 14-1 (51) of the Connecticut General Statutes as amended from time to time.

Muffler means a device for abating sounds such as those produced by escaping gases.

Noise means any sound, the intensity of which exceeds the standards set forth in this chapter as it is amended from time to time.

Noise level means the sound-pressure level in decibels as measured with a sound-level meter using the A-weighting network. The level so read is designated dB(A) or dBA.

Person means any individual, firm, partnership, association, syndicate, company, trust, corporation, municipality, agency or political or administrative subdivision of the state or other legal entity of any kind.

Premises means any building, structure, land or portion thereof, including all appurtenances, yards, lots, courts, inner yards and real properties without buildings or improvements, owned or controlled by a person. The emitter's "premises" includes contiguous publicly dedicated street and highway rights-of-way, all road rights-of-way and waters of the state.

Property line means that real or imaginary line along the ground surface and its vertical extension which separates real property owned or controlled by any person from contiguous real property owned or controlled by another person, and separates real property from the public right-of-way.

Public right-of-way means any street, avenue, boulevard, highway, sidewalk, alley, park, waterway, railroad or similar place which is owned or controlled by a governmental entity.

Recreational vehicle means any internal-combustion-engine-powered vehicle which is being used for recreational purposes.

Refuse means municipal solid waste, bulky waste and yard waste, garbage, household rubbish, ashes and any organic wastes normally produced from the handling and use of foods, except dishwater and wastewater.

Residential wne.means all city-owned property used for recreational or educational purposes, all residential districts (RS-1, RS-2, RM-1, RM-2, RH-1, RH-2 and RO), any commercial district when used for residential purposes, as defined in the zoning regulations of the City of New Haven as they are amended from time to time, and all uses permitted therewith either as a right or as a special use.

Sound means a transmission of energy through solid, liquid or gaseous media in the form of vibrations which constitute alterations in pressure or position of the particles in the medium and which, in air, evoke physiological sensations, including but not limited to an auditory response when impinging on the ear.

Sound-level meter means an instrument used to take sound-level measurements and which should conform, at a minimum, to the operational specifications of the American National Standards Institute for Sound Level Meters, Sl.4--1971 (Type S2A) as amended from time to time.

Sound-pressure level means twenty (20) times the logarithm to the base ten (10) of the ratio of the.pressure of a sound to the reference pressure of twenty (20) micronewtons per square meter (20x 10- 6 newtons/meter 7) and which is expressed in decibels (dB).
Noise level measurement procedures.

For the purpose of determining noise levels as set forth in this chapter, the following guidelines shall apply:

(1) all personnel conducting sound measurements shall be trained in the current techniques and principles of sound-measuring equipment and instrumentation;

(2) instruments used to determine sound-level measurements shall conform to the performance standards as defined in the section captioned "Noise levels" as ·amended from time to time;

(3) the general steps listed below shall be followed when preparing to take sound-level measurements;

(i) the instrument manufacturer's specific instructions for the preparation and use of the instrument shall be followed;

(ii) the sound-level meter shall be calibrated before and after each set of measurements;

(iii) when measurements are taken out of doors, a wind screen shall be placed over the microphone of the sound-level meter as per the manufacturer's instructions;

(iv) the sound-level meter shall be placed at an angle to the sound source as specified by the manufacturer's instructions, and be at least four (4) feet above the ground. The meter shall be placed as to not be interfered with by individuals conducting the measurements; and

(v) measurements shall be taken at a point that is located about one **(1)** foot beyond the boundary of the emitter's premises and within the receptor's premises. The emitter's premises include his/her individual unit of land, or ground of contiguous parcels under the same ownership as indicated by public land records.

Noise levels.

(a) It shall be unlawful for any person to emit or cause to be emitted any noise beyond the boundaries of his/her premises in excess of the noise levels established in these regulations as amended from time to time.

(b) Noise level standards.

(1) No person in a residential zone shall emit noise beyond the boundaries of his/her premises that exceeds the levels stated herein, and applies to adjacent residential, commercial or industrial zones.

Emitter's Zone:

Residential

Receptor's Zone: Maximum Level:

Industrial . . . 62 dBA
Commercial …55 dBA
Residential/Day . . . 55 dBA
Residential/Night . . . 45 dBA

(2) No person in a commercial zone shall emit noise beyond the boundary of his/her premises that exceeds the levels stated herein and applies to adjacent residential, commercial or industrial zones:

(3) Any non-conforming use shall be deemed to be in the zone which corresponds to the actual use.

High background noise levels and impulse noise.

(a) Ifbackground noise levels caused by sources not subject to these regulations exceed the standards contained herein as amended from time to time, a source shall be
considered to cause excessive noise if its emission exceeds the background noise levels by five (5) decibels, provided that no source subject to this article shall emit noise in excess of eighty (80) decibels at any time, and provided that this section does not decrease the permissible levels of other sections of this chapter·as amended from time to time.

(b) No person shall cause or allow the emission of impulse noise in excess of eighty (80) decibels peak sound-pressure level during the nighttime to any residential noise

(c) No person shall cause or allow the emission of impulse noise in excess of one hundred (100) decibels peak sound-pressure level at any time in any zone.

Exclusions.

The above restrictions of sound levels shall not apply to noise emitted by or related to:

(1) natural phenomena;

(2) any bell or chime from any building clock, school or church;

(3) any siren, whistle or bell lawfully used by emergency vehicles or any other alarm systems used in an emergency situation; provided, however, that burglar alarms not terminating within fifteen (15) minutes after being activated shall be unlawful. Notwithstanding the foregoing, repetitive activation of any alarm system due to malfunction or lack of proper maintenance shall not be excluded. However, the owner of an alarm mechanism will not be held liable if it is activated

without his/her fault or negligence;

(4) warning devices required by Occupational Safety and Health Administration or other state or federal safety regulations; and

(5) farming equipment or farming activity.

Exemptions and special conditions.

The following shall be exempt from these regulations, subject to special conditions as provided herein:

(1) noise generated by any construction equipment which is operated between the hours of 7:00 a.m. and 10:00 p.m. on Mondays through Saturdays, and 9:00 a.m. and 9:00 p.m. on Sundays. The building official or the director of public works must approve the operation of the same during hours other than those allowed by this section. The person requesting such approval must apply for it at least seven (7) days before the date for which approval is sought. Approval may be granted if the requesting person makes an advanced payment
for the actual cost of such inspection services as may be required under applicable rules and regulations as amended from time to time;

(2) noise created as a result of or relating to an emergency;

(3) noise from domestic power equipment such as, but not limited to, power saws, sanders, grinders, lawn and garden tools or similar devices operated between the hours of 7:00 a.m. and 10:00 p.m. on Mondays through Saturdays, and 9:00 a.m. and 9:00 p.m. on Sundays, provided that noise discharge from exhaust is reasonably muffled;

(4) noise from snow removal equipment, provided it is maintained in good repair and exhaust is reasonably muffled;

(5) noise from demolition work conducted between the hours of 7:00 a.m. and 10:00 p.m. on Mondays through Saturdays, and 9:00 a.m. and 9:00 p.m. on Sundays, provided that demolition shall be exempted at all times from the noise levels set in this regulation when it is considered emergency work;

(6) noise created by any aircraft flight operations, which the Federal Aviation Administration specifically preempts;

(7) noise created by any lawful recreational activities, and for which the city has granted a license or permit, including but not limited to parades, sporting events, outdoor concerts, firework displays and non-amplified religious activities;

(8) noise involving blasting other than that conducted in connection with construction or demolition activities, provided that the blasting is conducted between the hours of 7:00

a.m. and 10:00 p.m. on Mondays through Saturdays, and 9:00 a.m. and 9:00 p.m. on Sundays, at specified hours previously announced to the local public, or provided that a permit for such blasting has been obtained from local authorities;

(9) noise created by products undergoing tests, where one (1) of the primary purposes of the test is to evaluate product noise characteristics, and where practical noise control measures have been taken;

(10) noise generated by transmission facilities, distribution facilities and substations of public utilities providing electrical power, telephone, cable television or other similar services, and located on property which is not owned by the public utility, and which may or may not be within utility easements; and

Motor vehicle noise.

(a) All motor vehicles operated within the limits of the City of New Haven shall be subject to the noise standards and decibel levels set forth in the regulations authorized in federal, state and local laws and regulations, including but not limited to Conn. regulation sections 14-80a-1a through 14-80a-1Oa as amended from time to time.

(b) No motor or recreational vehicles shall emit noise from a loud amplification device or similar equipment which exceeds noise level standards for residential zoned areas.

Refuse collection noise

All refuse collectors shall comply with the noise level standards as established in this article while engaging in refuse collection at each location. For purposes of this article, the term "refuse collectors" shall be synonymous with private haulers, and all other persons that commercially engage in the collection and transportation of refuse and other debris.

Inspections.

For the purpose of determining compliance with the provisions of this article, the following provisions shall apply:

(a) The city's health director or his/her designee is hereby authorized to make inspections of stationary or fixed noise sources, and to take measurements and make tests whenever necessary to determine the quantity and character of noise.

(b) The city's chief of police or his/her designee is hereby authorized to make inspections of mobile noise sources including refuse collection, demolition, construction and vehicular activities, and to take measurements and make tests whenever necessary to determine the quantity and character of noise.

(c) Inthe event that any person refuses or restricts local authorized officials from entry and free access to any part of a premises, or refuses to allow such officials to

inspect, test or measure noise generated from any activity, device, facility or process, said officials may seek an administrative warrant from an appropriate court to obtain such access for the aforesaid purposes.

(d) It shall be unlawful for any person to refuse to allow or permit local authorized officials free access to any premises when they are acting in compliance with a warrant for inspection that is issued by the appropriate court.

(e) It shall be unlawful for any person to violate the provisions of any warrant or court order requiring inspection, testing or measurement of noise sources.

(f) No person shall hinder, obstruct, delay, resist, prevent in any way, interfere or attempt to interfere with any authorized person while in the performance of his/her duties under this chapter as amended from time to time.

Violations and penalties.

Any person violating this article shall be fined one hundred dollars ($100.00) per occurrence. Each day such violation continues shall constitute a separate violation.

Variances.

(a) Any person residing or doing business in New Haven, who is negatively affected by the application of this article's provision(s), may seek a variance to engage in the prohibited activity. An applicant for a variance must supply the following information:

(1) location and nature of activity;
(2) the time period and hours of operation of said activity;
(3) the nature and intensity of the noise that will be generated; and
(4) any other information required by the appropriate city authority.

(b) No variance from these regulations shall be issued unless it has been demonstrated that:

(1) the proposed activity will not violate any Connecticut Department of Environmental Protection regulation(s) as amended from time to time;

(2) the noise levels generated by the proposed activity will not constitute a danger to public health, safety, welfare or quality of life; and

(3) compliance with the regulations constitutes an unreasonable hardship on the applicant.

Noise variance review committee.

(a) A noise variance review committee is hereby established to consider variance requests.

(b) This committee shall consist of the city's health director, chief of police, public works director and building official or their respective designees. Additionally, the committee shall include an alderman who is appointed by the president of the board of aldermen.

(c) The committee shall review each variance application, and either approve or reject it within fifteen (15) days of its receipt. The approval or rejection shall be in writing, and shall state the condition(s) of approval, if any, or the reasons for rejection.

(d) Failure to rule on the application within the designated time shall constitute approval of the variance.

Administration.

The city's health director and chief of police are hereby authorized to make regulations from time to time that are consistent with the State Public Health Code, and the regulations of the State Department of Environmental Protection regarding noise as each is amended from time to time. Such regulations shall become effective upon the board of aldermen's approval.

Contracts.

Any written agreement, purchase order or contract whereby the City of New Haven is committed to expending funds in return for work,·labor, services, supplies, equipment, materials or any combination thereof shall not be entered into unless such document contains provisions that any equipment or activities which are subject to the provisions of this chapter will be operated, constructed, conducted or manufactured without violating this article as it is amended from time to time.

Mediation.

(a) If the city's chief of police receives a complaint alleging a violation of this article by noise emanating from a construction, demolition, refuse collection or vehicular activity, he/she is expressly authorized to mediate such dispute within forty-eight (48) hours, provided that the following conditions apply:

(1) he/she is satisfied that the complainant is aggrieved by the alleged violation;
(2) there is reasonable grounds to believe that there is a violation of this article; and
(3) he/she determines that the particular facts and circumstances suggest that such mediation may result in a satisfactory resolution of the complaint.

(b) Nothing herein is intended to affect or in any way limit any other procedures established elsewhere in this article, limit any other powers granted to the local

authorized officials, or require the city's chief of police to invoke the mediation powers herein established.

Effect on other regulations.

All of the city's zoning regulations which are more stringent than those set forth herein shall remain in full force and effect. If any word, clause, paragraph or section of this chapter is held to make the same unconstitutional, this article shall not thereby be invalidated, and the remainder of this article shall continue in effect. Any provision herein which conflicts with the Connecticut General Statutes or the state's Public Health Code as each is amended from time to time is hereby repealed, inasmuch as said statutes and code shall take precedence over this article:

Enforcement.

(a) Notwithstanding anything contained herein to the contrary, the city's health director or his/her designee is hereby authorized to enforce this article regarding stationary or fixed noise sources.

(b) Notwithstanding anything contained herein to the contrary, the city's chief of police or his/her designee is hereby authorized to enforce this article regarding mobile noise sources, including refuse collection, demolition, construction and vehicular activities.

(c) Notwithstanding anything contained herein to the contrary, all local authorized officials, including but not limited to zoning enforcement officers, shall have the authority to enforce this article.

Appeals.

Any person aggrieved by a decision rendered by the issuer may appeal said decision in accordance with section 17-1.16 of this code as it is amended from time to time.