

PROJECT MANUAL

ARPA Renovations Girls Inc.

130 Lincoln Street
Meriden, CT 06451



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ISSUED FOR BIDDING

March 12, 2024

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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: ARPA Renovations – Girls Inc of Meriden

- B. Project Location: 130 Lincoln Street Meriden, CT 06451

- C. Owner: Girls Inc of Meriden

- D. City of Meriden Project Manager:

Matt Peacock
KBE Building Corporation
76 Batterson Park Rd, Farmington, CT 06032
(860) 284 7622
mpeacock@kbebuilding.com

- E. Architect: Christopher Williams Architects LLC
Contact: Christopher Williams
85 Willow Street
New Haven, Connecticut 06511

(203) 776 0184
cwilliams@cwarchitectsllc.com

- F. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

MEP
Integrated Engineering Services, LLC
33 North Plains Industrial Road
Wallingford, CT 06492

HAZMAT
EnviroMed Services INC
470 Murdock Avenue
Meriden, CT 06450

- G. Authorities Having Jurisdiction

City of Meriden Fire Marshal
142 East Main Street
Meriden, CT 06450

City of Meriden Building Department
142 East Main Street
Meriden, CT 06450

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work of the Project generally consists of, but is not limited to, the following and is more specifically defined by the Contract Documents:
1. Exterior concrete ramp for access to First Floor.
 2. Replacement of existing brick floor @ Basement with a concrete slab on grade.
 3. Waterproofing of Basement masonry walls
 4. Replacement of Third Floor Ceiling.
 5. Mechanical Work, including:
 - a. Installation of new underground gas service from Lincoln Street (by the utility company).
 - b. Basement boiler and water heater replacement.
 - c. Replacement of existing fan coil units at First and Second Floors.
 - d. Addition of fan coil units at select locations.
 - e. Replacement of air handling units at Gymnasium and Basement.
 - f. Installation of exhaust fans at First and Second Floor toilet rooms.
 - g. Installation of exhaust fan and ductwork at Third Floor
 6. Electrical Work including:
 - a. Upgrade of building electrical service
 - b. Work related to installation of mechanical equipment.
 - c. Removal and reinstallation of Third Floor heat detectors and lighting related to ceiling replacement.

7. Site work related to installation of exterior ramp, electrical and gas services
8. Hazardous Materials abatement related to architectural & MEP work

- B. Type of Contract: Project will be constructed under a single prime contract.
- C. Duration of Construction period: 180 days from issuance of building permit 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, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - 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. Fire Alarm System: This project involves removing and reinstalling the Third Floor Heat detectors which are tied into the fire alarm system in a way that maintains fire alarm coverage at all times during occupancy. The contractor shall be responsible for maintaining a fully functional operating system, including any temporary devices and/or wiring until the new system is inspected, tested and accepted by the Authorities with Jurisdiction.
- D. 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. Maintain all affected components of the security, access control and intercom system. Provide security personnel during any shutdown times.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Girls Inc will be fully occupied during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than ninety-six (96) hours in advance of activities that will affect Owner's operations.

1.7 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 the following, unless allowed otherwise by Owner:
 1. September - Mid-June: Monday - Friday, 9:30 am – 5:00 pm
 2. Mid_June - August: Monday - Friday, 7:30 am – 5:00 pm
- C. Fire Watch: At all times when the fire alarm system is disabled, or shut down for modifications, provide a fire watch in accordance with the requirements of the City of Meriden.
- D. Retain "Existing Utility Interruptions" Paragraph below for existing utilities. Coordinate with requirements for temporary utilities specified in Section 01 5000 "Temporary Facilities and Controls."
- E. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner 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 SEVEN (7) calendar days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- F. 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.
- G. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

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

1.9 SECURITY

- A. Any employee of a contractor that is assigned this project, shall, 1 month prior to initiating work at the work site, submit all employees and subcontractor names to the City of

Meriden, to include a copy of a driver's license or other government issued identification card, for the purpose of a background check.

- B. Following the initial submission of names and identification, the contractor shall make available all employees approved for the work site to submit their fingerprints via a digital submission for a national database search of fingerprints for any disqualifying events.
- C. Contractor agrees to have a National Sex Offender Public Registry check completed on each of its agents, employees, volunteers, and subcontractors before permitting any such individual(s) to perform any work or enter upon the premises where any work is being performed under this agreement. If any such individual(s) have committed a sex offense, then Contractor agrees to prevent and prohibit them from performing any work or entering upon the premises where any work is being performed under this agreement
- D. Any employee or subcontractor found to have a disqualifying event on their history will not be allowed to enter or complete any work within the project.

1.10 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)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

SECTION 01 2200 - UNIT PRICES

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 unit prices.
 - 1. A unit price is an amount stated on the Proposal Form or in the Specifications as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the quantities of Work required by the Contract Documents are increased or decreased. Should the number of units anticipated substantially increase by more than ten (10) percent, such unit price shall be renegotiated.
 - 2. Upon request, provide a complete breakdown of how the unit price was calculated. Unit Prices include all necessary material, delivery, equipment and manpower, overhead and profit, and applicable taxes.
 - 3. Refer to individual Specification Sections for construction activities requiring the establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- B. Related Requirements:
 - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. 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.

1.4 PROCEDURES

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

- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. For adjustment of the Contract Sum, track and provide supporting documentation (delivery or removal/disposal tickets) as deemed necessary to confirm Unit quantities provided or removed. Such quantities shall be tracked against any specific "Allowance" line item which may be included within the base contract value. Contractor must report status of Unit Price Allowances regularly and not exceed such allowance value without prior authorization from the Owner. Unit Price that does not have an allowance applied to it shall be treated with a CCD until all quantities have been determined. 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. Should it be determined that the work measured by the independent surveyor is five (5) or more percent less than the Contractor's reported measurement, Contractor shall be responsible for the cost associated with the independent survey and adjustment to the measurement.
- 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Interior Painting (gypsum board and plaster partitions).
1. Description: Preparation and painting of interior gypsum board partitions per Section 09 9123.
 2. Unit of Measurement: Square foot.

END OF SECTION 01 2200

SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PRECONSTRUCTION CONFERENCE

- A. The Contractor shall prepare the agenda, which shall include:
1. Submittals: Those received prior to the conference and those due at the conference. Any necessary discussion covering future Submittals will be covered at this time, including the requirement for maintaining and submitting Record Drawings. At a minimum, the following Submittals will be discussed:
 - a. Certificate of Insurance.
 - b. Labor and Material Payment Bond.
 - c. Construction Schedule.
 - d. Submittal Schedule.
 - e. Schedule of Values.
 - f. Approved Applicator Certificates.
 - g. Safety Submittal.
 - h. Record Drawings.
 - i. Review of the Contractor's proposed Schedule and proposed workforce size.
 2. Review of final list of Subcontractors and material suppliers.
 3. Review of the Contract Documents to resolve errors, omissions or inconsistencies discovered.
 4. Review of job conditions, including:
 - a. Work by other contractors.
 - b. Work by other contractors.
 - c. Owner occupancy during construction.
 - d. Protection of existing surfaces and finishes.
 - e. Maintenance of exits.
 - f. Weather protection procedures.
 - g. Landscape protection.
 5. Review planned use of Owner's facilities, such as stairwells, loading docks, elevators, and driveways. Confirm Owner's requirements for scheduling such use and protecting the facilities from damage.
 6. Review Owner's Safety Advisory and regulatory requirements applicable to staging, work platforms, catch platforms, sidewalk bridges, safety netting, street closings, hoisting equipment, protective devices and hazardous materials.
 7. Review Owner's Safety Advisory and general project requirements.
 8. Security procedures:

- a. Confirm communications network.
 - b. Personnel identification.
 - c. Parking assignments.
 - d. Workforce comporment.
9. Review temporary utility requirements:
- a. Power.
 - b. Lighting.
 - c. Telephone.
 - d. Water.
 - e. Heat and Ventilation.
 - f. Sanitary facilities.
10. Review field office requirements.
11. Review material handling procedures such as:
- a. Methods of transport and disposal of demolished materials.
 - b. Locations of chutes and refuse receptacles.
 - c. Delivery dates of materials.
 - d. Storage and protection of materials delivered to the site.
 - e. Storage and protection of materials delivered off site, including access for cost certification inspections.
12. Discuss project administration procedures.
13. Provisions for Owner and Design Professional's access to the work.
14. Scheduling of construction or operations to be done by owner with his own forces or under separate contract.
15. Frequency, time, and location of project meetings.

1.2 PROGRESS MEETINGS

- A. Meetings will be held as agreed to review the Work in progress. Based on the stage of the Work and matters needing resolution, the Contractor shall invite Subcontractors and Consultants of all tiers as required by the Contractor, the Design Professional and the Owner.
1. Attendance shall be mandatory.
- B. The Contractor will prepare the agenda for the meeting, preside over it, record, reproduce and distribute the minutes.
- C. The Agenda shall include:
1. Problems that may impede progress and procedures to maintain schedule.
 2. Discussion of Work planned to be done before next meeting.
 3. Schedule pre-installation conferences.

4. Discuss findings or action items identified in previous pre-installation conferences.
5. Review delivery schedules.
6. Review proposed changes.
7. Review Submittal status.
8. Review applications and payments.
9. Other business as required by the progress of the Project.

1.3 JOB SITE ADMINISTRATION

- A. The Design Professional may have a Designated Representative present at the site while the Work is in progress.
 1. The Contractor shall provide ready, easy and safe access for the Design Professional and the Owner to all parts of the Work, whenever and wherever it is in progress.
 2. Failure to provide access may result in rejection of that portion of the Work to which access has been denied.
 3. If ladders, ramps, staging, lifts, and scaffolds that are erected, maintained, or operated for the Contractor's use in the performance of the Work, or safety equipment provide by the Contractor to the Design Professional are not acceptable to the Design Professional, this will be considered as denial of access to the Work.
 4. The Contractor shall coordinate Work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION (Not used)

END OF SECTION 01 3 000

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 the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
 - 2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
 - 3. Division 02 Section "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
 - 1. Digital Photographs: Submit image files within three days of taking photographs.
 - 2. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 3. Format: JPG2 with a minimum 3200 by 2400 pixels, uncompressed or layered in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped with key plan location number, in a folder named by date of photograph, accompanied by key plan file.
 - 4. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Date photograph was taken.
 - c. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - d. Unique sequential identifier keyed to accompanying key plan.
- B. Construction Photographs: Submit digital images in JPG2 format of photos taken within the month with the pencil draft of invoice being submitted for review.

- C. Aerial Photographs: If requested by the Owner, submit digital images in JPG2 format as outlined for digital cameras. If it is intended to use drones, Contractor must notify the Owner prior to use.

1.4 USAGE RIGHTS

- A. The photographic documentation ownership shall be the Owner. When necessary, provide or transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Designate a competent person 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.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to the Owner.
- D. Web Cameras: Are required for this project. When required, the system shall provide for time lapse videography with web view access at a minimum.
- E. Preconstruction Photographs: Before commencement of demolition for renovation projects or starting new construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take not less than 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take not less than 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
 - 5. Contractor has the option of video-taping as opposed to digital photos.

- F. Periodic Construction Photographs: Take no less than 20 photographs daily or at significant start and finish points of construction phases 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.
1. Significant Critical activities include but not limited to:
 - a. Commencement of the Work
 - b. Depth and connections of all utilities of subgrade construction.
 - c. Above-grade structural framing.
 - d. Exterior building enclosure.
 - e. Interior Work, through date of Substantial Completion.
- G. Owner-Directed Construction Photographs: From time to time, Owner may instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- H. Time-Lapse Sequence Construction Photographs: Take photographs as indicated, to show status of construction and progress since last photographs were taken.
1. Frequency: Take photographs hourly or as required by industry standards, coinciding with the cutoff date associated with each Application for Payment.
- I. Vantage Points: As identified in the Key Plan and accepted by the Owner, follow select vantage points. During each of the following construction phases, Final Completion Construction Photographs: Take color photographs after date of Substantial Completion for submission as project record documents. Key plan will inform photographer of desired vantage points or as directed by the Owner.
1. Do not include date stamp.
- J. Additional Photographs: Owner may request photographs in addition to periodic photographs specified.
1. Three days' notice will be given, where feasible.
 2. In emergency situations, take additional photographs within 24 hours of request.
 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

END OF SECTION 01 3233

SECTION 01 3300 - SUBMITTAL PROCEDURES

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. Work of this Section includes all labor, materials, equipment, and services necessary to complete submittal requirements as specified herein, including, but not limited to, the following:
 - 1. Construction Schedule.
 - 2. Schedule of Values.
 - 3. Submittal and Shop Drawing Schedule.
 - 4. Product data.
 - 5. Shop drawings.
 - 6. Coordination drawings.

PART 2 PRODUCTS

2.1 SHOP DRAWINGS AND SAMPLES

- A. General
 - 1. The Contractor shall be responsible for coordinating the schedule for submittal of shop drawings and samples with his progress schedule and the requirements of the Contract Schedule, and submit a coordinated schedule of submission of all shop drawings and samples to the Architect.
 - 2. Failure of the Contractor to schedule and submit shop drawings and samples in ample time for checking, correction, and rechecking will not justify any delay in the Contract Schedule. Allow ample time for items to be tested, including time for retesting if the tests or mock-ups fail.
 - 3. Samples, shop drawings, manufacturers' literature, and other required information shall be submitted in sufficient time to permit proper consideration and action on same before any materials and items are delivered on the work. Stagger submissions so that the Architect can review the documents in an orderly and timely manner. All samples of materials requiring laboratory tests shall be submitted to the laboratory for testing not less than 90 days before such materials are required to be used

in the work. All other samples, manufacturers' literature, and other sample information shall be submitted for approval not less than 30 days before such materials are required to be used in the work.

4. Shop drawings for each Section of the work shall be numbered consecutively, and the numbering system shall be retained throughout all revisions. Each drawing shall have a clear space for the stamps of the Contractor, Architect, and one of the Architect's consultants.
5. All shop drawings shall be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Architect and shall bear the Contractor's stamp of approval certifying that they have been so checked. Any shop drawings submitted without this stamp of approval and certification, and shop drawings which, in the Architect's opinion, are incomplete, contain errors or have not been checked, or only checked superficially, will be returned unchecked by the Architect for re-submission by the Contractor.
6. In checking shop drawings, the Contractor shall verify all dimensions and field conditions and shall check and coordinate the shop drawings of any Section or trade with the requirements of all other Sections or trades whose work is related thereto, as required for proper and complete installation of the work. The Architect will review shop drawings. The Architect's acceptance of shop drawings is for design only and not method of assembly or erection. Acceptance shall in no way be construed as (1) permitting any departure whatsoever from the Contract Documents; (2) relieving the Contractor of full responsibility for any error in details, dimensions, omissions, or otherwise that may exist; (3) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing, or deficiencies in strength; (4) relieving the Contractor of full responsibility for satisfactory performance of all work and coordination with the work of all subcontractors and other contractors; or (5) permitting departure from additional details or instructions previously furnished by the Architect. Acceptance of such drawings shall not be construed as a complete check, nor shall it relieve the Contractor from responsibility for proper fitting of the work, nor from the necessity of furnishing any work which may not be indicated on shop drawings when approved. The Contractor shall be solely responsible for any quantities which may be shown on the shop drawings.
7. No work shall be fabricated, manufactured, or installed from shop drawings stamped "Revise and Resubmit" or "Rejected," and such shop drawings shall be corrected and resubmitted by the Contractor until accepted by the Architect. At least one complete set of "No Exceptions Taken" and/or "Make Corrections Noted" shop drawings shall be kept at the site in the Contractor's field office for reference at all times. "Revise and Resubmit" or "Rejected" shop drawings shall not be permitted at the site.

8. Submittals Marked "No Exceptions Taken": Submittals which require no corrections by the Architect will be marked "No Exceptions Taken."
9. Submittals Marked "Make Corrections Noted": Submittals which require only a minor amount of correcting shall be marked "Make Corrections Noted." This mark shall mean that checking is complete and all corrections are obvious without ambiguity. Fabrication will be allowed on work marked "Make Corrections Noted" provided such action will expedite construction and noted corrections are adhered to. If fabrication is not made strictly in accordance with corrections noted, the item shall be rejected in the field, and the Contractor will be required to replace such work in accordance with corrected submittals.
10. Submittals Marked "Revise and Resubmit" or "Rejected": When submittals are contrary to contract requirements or too many corrections are required, they shall be marked "Revise and Resubmit" or "Rejected." No work shall be fabricated under this mark. The Architect shall list his reasons for rejection on the submittals or in the transmittal letter accompanying their return. The submittals must be corrected and resubmitted for approval.
11. All shop drawings and samples shall be identified as follows:
 - a. Date of submittal.
 - b. Title of project.
 - c. Name of Contractor and date of his approval.
 - d. Name of subcontractor or supplier and date of submittal to Contractor.
 - e. Number of submissions.
 - f. Any qualification, departure, or deviation from the requirements of the Contract.
 - g. Federal Specification or ASTM number where required.
 - h. Such additional information as may be required by the Specifications for the particular material being furnished.
12. If the Contractor wishes to deviate from the materials or details as shown in Specifications or Drawings, he shall submit the proposed deviation with shop drawings and/or samples stating the extent and the materials or details being replaced. The Contractor shall also submit information on the allowed credit or extra cost required for the proposed deviation, and also all information relating to the work of other Sections revised by the proposed deviation.
13. The Architect will review and approve shop drawings and samples for approval within 10 working days unless otherwise noted, 15 working days for Divisions 22, 23, 26, 31, 32 and 33, but only for conformance with the design concept of the work and with information contained in the Contract Documents.

14. Incomplete shop drawings will be returned without checking for proper submission, and this shall not be considered as cause for delay of the work or extra compensation to the Contractor.
15. The Contractor shall submit appropriate transmittal forms with every submittal of shop drawings, manufacturer's literature, and samples. The Contractor shall submit all required shop drawings, manufacturer's literature and samples in accordance with the procedures specified herein.
16. Unless otherwise specifically directed by the Architect, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.
17. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
18. The Contractor shall submit one copy of each standard referred to in the Specifications (ASTM, Fed. Spec., etc.) with the submission of each respective shop drawing, sample, or literature.

B. Submission of Shop Drawings

1. Electronic Construction Management Software: All submittals shall be submitted electronically through an online management system such as Procore. The General Contractor shall maintain an electronic website for shop drawings, RFIs, ASIs, etc.
2. Architectural Work: Submit one (1) pdf of each shop drawing to the Architect for approval through Procore or other Electronic Construction Management software. If submission is approved, the Architect will return one (1) pdf stamped "No Exceptions Taken" or "Make Corrections Noted," and the Contractor shall print the required number of copies. In the event the Architect returns one (1) pdf stamped "Revise and Resubmit" or "Rejected," the Contractor shall make indicated changes and resubmit one (1) pdf to the Architect through Procore or other Electronic Construction Management software.
3. Structural Work and Mechanical Work: Submit one (1) pdf of each shop drawing to the Engineer and Architect through Procore or other Electronic Construction Management software. If submission is accepted, the Architect shall return one (1) pdf stamped "No Exceptions Taken" or "Make Corrections Noted," and the Contractor shall print the required number of copies. In the event the Architect returns one (1) pdf stamped "Revise and Resubmit" or "Rejected," the Contractor shall make indicated changes and resubmit one (1) pdf to the Engineer and Architect through Procore or other Electronic Construction Management software.

4. Prints: The Contractor shall provide all prints or shop drawings as reasonably required by subcontractors, material suppliers, superintendents, inspectors, and others as required for the work, or as directed by the Architect. The Contractor shall pay all costs in connection with printing and distribution of shop drawings.
- C. Submission of Manufacturer's Literature, Including Catalog, Catalog Cuts, Brochures, Charts, Test Data, and Similar Information
1. Manufacturer's literature will receive consideration only when accompanied by the transmittal form properly filled out, as indicated, and listing each item of literature, as well as the Specification Section and paragraph numbers describing such materials. Any deviations from contract requirements shall be stated on the above form or attached to it.
 2. Architectural Work: Submit one (1) pdf copy of manufacturer's literature to the Architect for acceptance through Procore or other Electronic Construction Management software. If submission is accepted, the Architect will return one (1) copy stamped "No Exceptions Taken" or "Make Corrections Noted" through Procore or other Electronic Construction Management software. In the event the Architect returns the literature stamped "Revise and Resubmit" or "Rejected," he will return one (1) copy through Procore or other Electronic Construction Management software only. The Contractor shall resubmit one (1) copy of correct or corrected literature of all submissions stamped by the Architect "Revise and Resubmit" or "Rejected."
 3. Structural Work and Mechanical Work: Submit one (1) copy of manufacturer's literature to the Engineer and Architect through Procore or other Electronic Construction Management software. If submission is accepted, the Architect will return one (1) copy through Procore or other Electronic Construction Management software stamped "No Exceptions Taken" or "Make Corrections Noted." In the event the Architect stamps the literature "Revise and Resubmit" or "Rejected," he will return one (1) copy through Procore or other Electronic Construction Management software only. The Contractor shall resubmit one (1) copy of correct or corrected literature to the Engineer for all submissions stamped "Revise and Resubmit" or "Rejected" by the Engineer, with one (1) copy of correct or corrected literature with copy of the transmittal for to the Architect through Procore or other Electronic Construction Management software.
 4. All copies of manufacturer's literature required to be resubmitted hereunder shall be original printed material. Reproductions of printed material will not receive consideration.
- D. Submission of Samples
1. All samples shall be submitted in triplicate unless otherwise indicated in the Specifications.

2. Samples will receive consideration only when accompanied by the transmittal form properly filled out, as indicated, and listing each sample, as well as the listing of any ASTM, Federal or other standard references specified or applicable and such additional information as may be required by the Specifications for the materials being submitted. Any deviation from the contract requirements shall be so stated on the above form or attached to it.
3. The Architect shall have the right to require submission of samples of any materials, whether or not specifically indicated in the various Sections of the Specifications.
4. Unless otherwise specified, samples of sufficient size to indicate general visual effect shall be submitted. Where samples must show a range of color, texture, finish, graining, or other similar property, the Contractor shall submit sets of pairs illustrating the full scope of the range.
5. One (1) sample of each submission will be returned to the Contractor. Samples stamped "Revise and Resubmit" or "Rejected" by the Architect shall be resubmitted in triplicate by the Contractor.
6. All samples stamped "No Exceptions Taken" or "Make Corrections Noted" shall be kept at the site in the Contractor's field office facilities for reference at all times. "Revise and Resubmit" or "Rejected" samples shall not be kept at the site.

2.2 INTEGRATED DRAWINGS

- A. The HVAC subcontractor shall prepare a Drawing or Drawings showing duct work, heating and sprinkler piping. This Drawing shall include location of grilles, registers, etc., and access doors in hung ceilings. Locations shall be fixed by elevations and dimensions from column center lines and/or walls.
- B. The HVAC subcontractor shall prepare and distribute to the Plumbing and Electrical subcontractors, the General Contractor, and to the Architect a reproducible of the above.
- C. The HVAC subcontractor shall lay out on his reproducible the reflected ceiling plan, beam soffit elevations, ceiling heights, roof openings, etc.
- D. The Plumbing subcontractor shall lay out on his reproducible the piping, valves, clean-outs, etc., indicating locations and elevations and shall indicate the necessary access doors.
- E. The Electrical subcontractor shall indicate on his reproducible the fixtures, large conduit runs, clearances, pull boxes, junction boxes, sound system speakers, etc.
- F. The General Contractor shall indicate on his reproducible any structural framing, ceiling hangers, etc.

- G. The General Contractor shall call as many meetings with the subcontractors as are necessary to resolve any conflicts that become apparent. He will call on the services of the Consultant Engineer or Architect where necessary. The General Contractor is responsible for the coordination of the Drawing or Drawings.
- H. On resolution of the conflicts, each subcontractor shall enter his own work on the HVAC subcontractor's reproducible, which shall become the master or integrated Drawings. The master reproducible shall be signed by each contributing subcontractor to indicate his acceptance of the arrangement of the work.
- I. A reproducible copy of the master integrated Drawing will be prepared by the HVAC subcontractor. The General Contractor will make distribution.
- J. Each subcontractor shall prepare his Shop Drawings in accordance with the integrated Drawings. No work will be permitted without approved Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.

PART 3 EXECUTION

3.1 COORDINATION OF SUBMITTALS

- A. Prior to submittal for Architect's review, use all means necessary to fully coordinate all material, including the following procedures:
 - 1. Determine and verify all field dimensions and conditions, materials, catalog numbers and similar data.
 - 2. Coordinate as required with all trades and with public agencies involved.
 - 3. Secure all necessary approvals from public agencies and others and signify by stamp, or other means, that they have been secured.
 - 4. Clearly indicate all deviations from the Contract Documents.
- B. Unless otherwise specifically permitted by the Architect, make all submittals in groups containing all associated items; the Architect may reject partial submittals as not complying with the provisions of the Contract Documents.

END OF SECTION 01 3300

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		Contractor's Received Stamp	Contractor's Received Stamp
Contractor's Review Stamp		Contractor's Review Stamp	Contractor's Review Stamp
Consultant's Received Stamp		Consultant's Received Stamp	Consultant's Received Stamp
Consultant's Review Stamp		Consultant's Review Stamp	Consultant'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 4000 - QUALITY REQUIREMENTS

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 administrative and procedural requirements for quality assurance and quality control.

1.3 RELATED SECTIONS

- A. Divisions 2 through 32 Sections for specific test and inspection requirements.

1.4 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.5 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.6 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.

10. Ambient conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of Connecticut and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
 - d. When testing is complete, remove assemblies; do not reuse materials on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups, unless otherwise directed by the Architect.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 4000

SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS

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. Work of this Section includes all labor, materials, equipment, and services necessary to complete the temporary facilities and controls as shown on the drawings and specified herein, including, but not limited to, the following:

1. Construction sign.
2. Hoists, stairs, and ladders.
3. Rodent control.
4. Construction fence.
5. Field office.
6. Fire protection.
7. Temporary utilities.
8. Temporary toilets.
9. Temporary site access.
10. Security.
11. Water and snow control.
12. Environmental controls.

1.3 RELATED SECTIONS

- A. Product Requirements - Section 01 6000.
- B. Execution Requirements - Section 01 7300, for progress cleaning.

PART 2 PRODUCTS

2.1 GENERAL

- A. Arrange for and provide temporary facilities and controls as specified herein and as required for the proper and expeditious prosecution of the work. Pay all costs, except as otherwise specified, until final acceptance of the work unless

the Owner makes arrangements for the use of completed portions of the work after substantial completion.

- B. Make all temporary connections to utilities and services in locations acceptable to the local authorities having jurisdiction thereof; furnish all necessary labor and materials, and make all installations in a manner subject to the acceptance of such authorities; maintain such connections; remove the temporary installation and connections when no longer required; restore the services and sources of supply to proper operating condition.
- C. Unless otherwise noted, pay all costs for temporary electrical power, temporary water, and temporary heating; provide metering as necessary.
- D. A Staging Plan shall be submitted by the Contractor for approval by the Owner. The Staging Plan shall locate all temporary facilities and services, including parking for the Contractor's employees, within the limits of the staging areas, and shall allot ground space to Subcontractors for storage of materials, and the erection of sheds and tool houses. Materials and equipment can only be stored in the staging area. No parking for Contractor's or Subcontractors' employees' vehicles will be allowed in undesignated parking areas. The staging area shall be maintained in good repair, free of mud and standing water, and passable at all times. All materials stored within the project site are the responsibility of the Contractor. At the completion of the work, the staging areas shall be restored to their original condition, gravel removed, topsoil replaced and graded and re-seeded.

2.2 PROJECT IDENTIFICATION

- A. No signs or advertisements will be allowed to be displayed on the premises without the approval of the Owner.
- B. One construction sign on the site shall be provided by the Contractor and shall be subject to the review of the Architect and the approval of the Owner.
- C. Erect the construction sign on the site where directed by the Architect. Provide sign approximately 4 ft. x 8 ft. in size, of 3/4 in. plywood with structural supports. Use Douglas Fir Overlaid Plywood, Grade B-B high density, exterior, good two sides, complying with PS-1. The sign shall be primed and given two coats of alkyd white paint. Lettering shall be black of a type, size, and lay-out as directed by the Owner. Sign shall contain the name of the Building, Owner, Architect, Contractor, and such other information as the Architect or Owner may require.

2.3 MATERIAL HOIST

- A. Provide a material hoist as required for use by all trades. Provide all necessary guards, signals, safety devices, and so on, required for safe operations, and suitable runways from the hoists to each floor level and roof. The construction and operation of the material hoist shall comply with all applicable requirements

of ANSI A10.5, the ACG Manual of Accident Prevention in Construction and to all applicable state and municipal codes. Prohibit the use of the material hoist for transporting personnel.

2.4 RODENT CONTROL

- A. Institute an effective program of rodent control for the entire site within the construction limits. Cooperate with local authorities and provide the regular services of an experienced exterminator who shall visit the site at least once a month for the entire construction period. Provide marked metal containers for all edible rubbish and enforce their use by all employees. Containers shall be emptied and the contents removed from the site as often as required to maintain an adequate rodent control program. If the program of rodent control used is not effective, take whatever steps are necessary to rid the project of rodents, and such action shall not be the basis of a claim for additional compensation or damages.

2.5 TEMPORARY CONSTRUCTION OPENINGS

- A. Provide openings in slabs, walls, and partitions where required for moving in large pieces of equipment of all types. Close and/or restore all openings and finish them after the equipment is in place. Structural modification, if required, shall be subject to review by the Architect.

2.6 TEMPORARY FENCE

- A. Provide and maintain an 8 foot high temporary fence to enclose the area at the job site and to guard and close effectively the designated area. Provide gates at locations where required for access to the enclosed area. Gates shall be cross-braced, hung on heavy strap hinges, and shall have hasps and padlocks. Submit shop drawings of fence and gates for review of Architect and Owner. Paint the fence with two coats of an approved paint.
- B. Remove the fence upon completion of the work or at such time before final completion as directed by the Owner.

2.7 TEMPORARY FIELD OFFICES

- A. Provide and maintain a field office with a telephone, internet access and computers at the job site with not less than 200 square feet of space. The office shall be complete with light, heat, air conditioning, toilet facilities, electric water cooler, plan racks, four-drawer metal file with lock, shelves for samples, tables, chairs, and janitor service. When it becomes possible to establish an office in the building, office accommodation of approximately the same size as those in the field offices, including the services above, shall be provided and maintained until the issuance of a certificate of substantial completion. Temporary offices shall be removed when no longer required. Provide a telephone and fax line with machine and pay all charges for installation and calls, including long distance calls.

2.8 FIRE PROTECTION

- A. Provide and maintain adequate fire protection, ready for instant use, distributed around the project.
- B. Make arrangements for periodical inspection by local fire protection authorities and insurance underwriters inspections. Cooperate with said authorities and promptly carry out their recommendations.
- C. Open fire will not be permitted within the building enclosure or on the project site.

2.9 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat as required during construction to protect the work from freezing or frost damage, and as necessary to ensure suitable working conditions for the construction operations of all trades. In areas of the building where work is being conducted, the temperature shall be maintained as specified in the various sections of the Specifications, but not less than 45 degrees Fahrenheit. Under no circumstances shall the temperature be allowed to reach a level that will cause damage to any portion of the work which may be subject to damage by low temperatures.
- B. Until the building, or any major portion thereof, is enclosed, temporary heating shall be by smokeless portable unit heaters of type listed by Underwriter's Laboratories, Factory Mutual, and the Fire Marshall. Pay for fuel, maintenance, and attendants required in connection with the portable unit heaters. Interior or exterior surfaces damaged by the use of these space heaters shall be replaced by new materials or be refinished.
- C. The building shall be considered enclosed when it has reached the stage when exterior walls have been erected, the roof substantially completed, exterior openings closed up either by the permanently glazed windows and doors, or by adequate temporary closing, and the building is ready for interior masonry and plastering operations.
- D. After the building, or any major portion thereof, has been enclosed, the permanent heating system as specified below may be used for temporary heat.
- E. When the permanent heating system, or a suitable portion thereof, is in operating condition, the system may be used for temporary heating, provided that the Contractor assumes full responsibility for the entire heating system, and pays all costs for fuel, operation, maintenance, and restoration of the system.
- F. Provide adequate ventilation as required to keep the temperature of the building within 10 degrees Fahrenheit of the ambient outdoor temperature when such ambient temperature exceeds 70 degrees Fahrenheit, and to prevent accumulation of excess moisture or to prevent excess thermal movement in the building.

- G. When the permanent air circulation system, or a suitable portion thereof, is in operating condition, it may be used without refrigeration or chilling, provided that the Contractor assumes full responsibility for the system which he is using, and pays costs for power, operation, maintenance, and restoration of the system. Provide temporary filters to adequately filter air being distributed through the duct work to the supply outlets; disposable filters shall be placed in front of all exhaust registers to keep construction dirt out of exhaust duct work. The Contractor shall thoroughly clean the interior of the air handling units and duct work prior to acceptance of the work.
- H. Upon conclusion of the temporary heating period, remove all temporary piping, temporary heating units, or other equipment and pay all costs in connection with repairing any damage caused by the installation or removal of temporary heating equipment. Thoroughly clean and recondition those parts of permanent heating and air circulation systems used for temporary service.

2.10 TEMPORARY LIGHT AND POWER

- A. Make all arrangements with the local electric company for temporary electrical service to the construction site; provide all equipment necessary for temporary power and lighting; and pay all charges for this equipment, the installation thereof, and for current used. The electrical service shall be of 120v and 240v for single phase loads up to 30 amps for all construction tools and equipment without overloading the temporary facilities and shall be made available for power, lighting, and construction operations of all trades.
- B. In addition to the electrical service, provide power distribution as required throughout structure. The terminations of power distribution shall be at convenient locations in the building. Terminations shall be provided for each voltage supply complete with circuit breakers, disconnect switches, and other electrical devices as required to protect the power supply system.
 - 1. Provide double duplex outlets at not more than 200' o.c. both directions throughout this building.
- C. A temporary lighting system shall be furnished, installed, and maintained as required to satisfy minimum requirements of safety and security. The temporary lighting system shall afford general illumination in all building areas and shall supply not less than 150 watt lamps on 30' centers both directions of floor area for illumination in the areas of the building where work is being performed.
- D. All temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of the governing codes. All temporary wiring shall be maintained in a safe manner and used so as not to constitute a hazard to persons or property.
- E. When the permanent electrical power and lighting systems are in operating condition, they may be used for temporary power and lighting for construction purposes, provided that the Contractor assumes full responsibility for the entire

power and lighting system, and pays costs for power, operations, maintenance, and restoration of the system.

2.11 TEMPORARY ACCESS TO SITE

- A. Construct and maintain in good usable condition all required temporary access to site, and, when no longer required, remove all temporary construction and restore the site.
- B. Where streets now in use are within or adjacent to the work, keep the passageways of such streets open to vehicular and pedestrian traffic to building fronting thereon. Maintain constant access for police, fire and ambulance service.
- C. Mud carried off the site and into public roads shall be removed immediately by the Contractor.
- D. Access to the site for delivery of construction material or equipment shall be made only from locations designated by the Architect.

2.12 TEMPORARY STAIRS, LADDERS, RAMPS, SIDEWALK BRIDGING AND RUNWAYS

- A. Provide and maintain all equipment such as temporary stairs, ladders, ramps, runways, and chutes as required for the proper execution of the work.
- B. All such apparatus, equipment, and construction shall meet all requirements of the Labor Law and other state or local laws applicable thereto.
- C. As soon as permanent stairs are erected, provide temporary protective treads, handrails, and shaft protection.
- D. Covered Walkway: Erect a structurally adequate, protective, covered walkway for passage of persons along adjacent public street. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
 - 1. Construct covered walkways using scaffold or shoring framing.
 - 2. Provide wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well drained walkways, and similar provisions for protection and safe passage.
 - 3. Extend back wall beyond the structure to complete enclosure fence.
 - 4. Paint and maintain in a manner approved by Owner and Architect.
 - 5. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" thick exterior plywood.

2.13 TEMPORARY TOILETS

- A. Provide and maintain in a sanitary condition enclosed weathertight toilets for the use of all construction personnel at a location within the contract limits. Upon completion of the work, toilets shall be removed. Installation shall be in accordance with all applicable codes and regulations of authorities having jurisdiction. The number of toilet rooms required shall be in accordance with the ANSI Standard Safety Code for Building Construction or other local authorities.

2.14 TEMPORARY WATER SERVICE

- A. Provide at a point within 10 feet of the building (or buildings) all water necessary for construction purposes. Make all temporary connections to existing mains; provide temporary meter; and make arrangements to pay for the temporary water service including cost of installation, maintenance thereof, and water used.
- B. Furnish drinking water with suitable containers and cups for use of employees. Drinking water dispensers shall be conveniently located in the building where work is in progress.
- C. When the permanent water supply and distribution system has been installed, it may be used as a source of water for construction purposes, provided that the Contractor assumes full responsibility for the entire water distribution system, and pays costs for operation, maintenance, and restoration of the system including the cost of water used.
- D. At the completion of the construction work or at such time after the Contractor makes use of the permanent water installation, all temporary water service equipment and piping shall be removed, and all worn or damaged parts of the permanent system shall be replaced and equipment placed in first class condition equal to new.

2.15 SECURITY

- A. Provide sufficient watchman service to prevent illegal entry or damage during nights, holidays, or other periods when work is not being executed, and such other control watchmen as required during working hours.
- B. Provide all temporary enclosures required for protecting the project from the exterior, for providing passageways, for the protection of openings both exterior and interior, and any other location where temporary enclosures and protection may be required.
- C. Take adequate precautions against fire; keep flammable material at an absolute minimum; and ensure that such material is properly handled and stored. Except as otherwise provided herein, do not permit fires to be built or open salamanders to be used in any part of the work.

2.16 WATER AND SNOW CONTROL

- A. From the commencement of the construction to the completion of the work, keep all parts of the site and the project free from accumulation of water, and supply, maintain, and operate all necessary pumping and bailing equipment.
- B. Remove snow and ice as necessary for the protection and prosecution of the work, and protect the work against weather damage.
- C. The Contractor shall take over responsibility for site drainage upon entering the premises and shall maintain such drainage until completion of the work so as not to adversely affect the adjacent areas.

2.17 ENVIRONMENTAL CONTROLS

- A. The Contractor shall comply with all applicable Federal, State and local laws, regulations, ordinances, codes and standards concerning environment control. Particular attention shall be given, without limitations, to:
 - 1. Minimization of dust, containment of chemical vapors, control of engine exhaust gases, and control of smoke from temporary heaters.
 - 2. Reduction of water pollution by control of sanitary facilities, proper storage of fuels and other potential contaminants, and prevention of siltation from land erosion.
 - 3. Minimization of noise levels.
 - 4. Proper and legal disposal, off site unless otherwise provided, of waste and spoil resulting from construction activities.

PART 3 EXECUTION

3.1 REMOVAL

- A. Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the work. Remove all such temporary facilities and controls as rapidly as progress of the work will permit or as directed by the Architect.

END OF SECTION 01 5000

SECTION 01 5640 – TREE PROTECTION AND PRESERVATION

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. This Section includes the protection and stress reduction of existing trees and vegetation that interfere with, or are affected by, execution of the Work, whether temporary or permanent. Work is to be coordinated with the contract documents which shall include a tree preservation plan authored by a certified arborist.
- B. The following specifications apply to work of the related to protection and stress reduction measures and coordination and oversight of the tree preservation Plan by the Owner. This work includes but is not limited to the following:
 - 1. Coordination of Temporary Tree and Plant Protection
 - 2. Selective tree removals for “Removal By Arborist” (RBA) (Contract Arborist) within Tree Protection Areas (TPAs)
 - 3. Root Pruning
 - 4. Temporary Site and Tree Protection Fencing and temporary sign installation referenced in Section 01-5000 Temporary Facilities and Controls
 - 5. Composted Mulching
 - 6. Liquid subsurface fertilization
 - 7. Temporary Limb Guying or Clearance Pruning for construction access
 - 8. Seasonal Supplemental Watering
 - 9. Monitoring and Treatment of Tree Health
 - 10. Supersonic Air Tool (SSAT) and Hand Excavation within the Critical Root Zones (CRZs)

1.3 DEFINITIONS

- A. Certified Arborist: Credential of an individual arborist issued and administered by the International Society of Arboriculture. This credential must be current and valid to qualify to use the copyrighted designation of “Certified Arborist”. Refer to www.isa-arbor.com for additional information.
- B. Contract Arborist: Arboricultural firm contracted to implement the approved tree preservation plans on site. All crews’ conduction arboricultural operations on site shall consist of at least one Certified Arborist who directly oversees all work by that crew. Arboricultural operations include, but are not limited to, pruning, tree protection device

installation and maintenance (fence, matting, etc.), root pruning, air tool root excavation/exploration (SSAT), soil care activities, soil testing, mulch application, tree inspections, pesticide/chemical applications and tree removal. Special qualifications submittal is required for review and approval below. Contract Arborist will be sub-contracted by the Contractor and cannot also be the individual or entity contracted as the Project Arborist for the Architect and/or Owner.

- C. Tree Protection Area (TPA): Area indicated on Drawings surrounding individual trees or groups of trees to be protected during construction.
- D. Supersonic Airtool (SSAT): Hand held tool designed to focus highly compressed air (90-125 psi) provided from a large air compressor (185-375 cfm) at speeds close to 1400 mph at the tip of the tool. Widely used by arboricultural firms and consultants for multiple purposes including but not limited to: root collar investigation, CRZ investigation, root pruning (especially large roots > 1.5" diameter or were existing underground cables or conduits are located, radial mulching and restoration of compacted soils, excavation for utilities within protected CRZs to minimize root damage from constriction.
- E. Tree Removal by Arborist: Action whereby the Contract Arborist removes trees designated for "Removal by Arborist" selected from inside the TPAs. Trees shall be taken down by hand sectionally, or directionally felled to minimize damage to adjacent tree canopies, root systems, or adjacent structures. Work shall be completed by a qualified contract arborist.
- F. Crown Pruning: Action by the Contract Arborist of pruning specific tree limbs to improve tree health, reduce hazard, and / or provide construction clearance.
- G. Supportive Cabling: Installation of supportive cabling for designated tree branches due to weak branch attachments.
- H. Root Pruning: Action indicated on Drawings to provide a more suitable cut for protected tree roots to minimize ripped or torn roots during excavations and grading with standard construction equipment. Various methods may be used.
- I. Mulching of Trees: Application of a wood mulch product to areas surrounding designated trees. Mulch increases moisture-holding capacity, helps mitigate soil compaction, and increases needed soil organic composition.
- J. Soil Amendments: Various product components applied to existing soil environment of protected trees, as indicated on Plan Notes.
- K. Tree Growth Regulator (*Paclobutrazol*): Products applied to designated trees used to regulate plant growth in such a way as to restrict canopy growth and free stored or produced energy for other uses in the tree. For highly impacted trees, more energy may be available for fibrous root growth (to combat root loss), thicker darker leaves (allowing for increased photosynthesis, and increased drought tolerance), and pest tolerance (often an issue with construction stressed trees); among other potential benefits.

- L. Limits of Disturbance (LOD) (also called Limits of Construction): Specific outer limits of all construction activities for the entire project.
- M. DBH (Diameter at Breast Height): Tree trunk diameter measured at 4.5 feet above grade.

1.4 SUBMITTALS

- A. The Contract Arborist shall provide submittals as follows:
 - 1. Product Data: For each type of product indicated
 - 2. Certification: For each phase, the Contract Arborist shall certify for each tree designated to remain has been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
 - 3. Qualification Data: For Contract Arborist Firm Qualifications, submit firm and individual qualifications as follows:
 - a. Submit a minimum of two resumes and detailed qualifications from staff or team individuals assigned to this project as detailed under Quality Assurance below. Due to the complexity of this project, standard arboricultural experience may not qualify.
 - b. Provide references for above from a minimum of three commercial, non-governmental or governmental projects for whom similar tree preservation programs have been successfully implemented. Include the following information:
 - 1) Project Name, size and scope
 - 2) Number and species of trees involved
 - 3) Relevant photos or aerials
 - 4) Scope of services provided
 - 5) Name and contact for project owner, designer, or contractor.
 - 4. Pedestrian / Property Protection Plan: Contract Arborist to submit a written plan describing all protective measures proposed to be used. Protection measures shall be required for all on-site tree care activities including but not limited to Supersonic Airtool excavation, root pruning, canopy pruning, etc. to minimize potential impact to pedestrians and property.
 - 5. Maintenance Prescription: Contract Arborist shall submit for care and protection of trees as a result of construction, changes in weather patterns or events, and response in health from individual trees during and after completing the Work.
 - 6. Soil Samples: Submit soil sample for analysis during site work phase of this project. Take representative soil samples from all areas of protected trees (landscape areas and street tree planting pits). Samples and procedures per local cooperative extension shall be followed. Forward reports to Engineer and Owner.

7. Soil Amendments: Contract Arborist shall submit specific fertilizer formulations, application rates and methods for review by Project Arborist. All fertilization and soil amendments shall be in conformance with soil test results.
8. Site Documentation: Submit weekly reports to the Owner containing complete documentation of all tree impacts and tree preservation activities including but not limited to: root pruning, tree protection fencing, excavation within critical root zones, tree fertilization or other treatments, etc. Documentation shall include tree numbers of trees impacted and / or treated. Complete daily photographic record is also required.
9. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damaged caused by construction activities.
 - a. Use sufficiently detailed photographs or videotape.
 - b. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
10. Tree and shrub removal of additional plants not under base contract will require a "request to remove plantings" form to be submitted to the Owner for approval prior to starting the removal.

1.5 QUALITY ASSURANCE

- A. Certified Arborist (individual) Qualifications: An arborist certified by the International Society of Arboriculture (ISA) and licensed in the jurisdiction where project is located. All work performed by Contract Arborist including any oversight and documentation work, shall be performed or directly supervised by at least one on-site arborist with these minimum qualifications.
- B. Contract Arborist Firm Qualifications:
 1. Contract Arborist Firm shall comply with the following:
 - a. Established business with documented experience of at least five years.
 - b. Experience working on a minimum of three commercial, nongovernmental or governmental projects where similar tree preservation programs have been successfully implemented.
 - c. Properly licensed and insured to perform arboricultural work in the jurisdiction where the project is located.
 2. Provide names of each individual to comply with the following:
 - a. Minimum BS degrees in forestry, arboriculture, or related field and Certification in ISA.
 - b. Resumes should reflect combined 10 years full time experience on similar tree preservation projects.
 - c. Provide individual(s) names, certifications, and each anticipated role in this project. "Role(s)" shall be defined as one or more of the following:
 - 1) Project Manager
 - 2) Technical Oversight
 - 3) Field Arborist / Technician

3. For each staff member, list a minimum of three construction projects and a minimum three years' experience in the following technical applications:
 - a. Soil amendment prescriptions and applications
 - b. Supersonic Airtool Excavations for underground utilities exceeding 24" depth.
 - c. Root Protection Matting or similar applications
- C. Part of this work to extent referenced shall include but not be limited to the following:
 1. ANSI A300 Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance.
 2. Part 1-2001, Tree Pruning;
 3. Part 2-3004, Fertilization;
 4. Part 3-2000, Cabling, Bracing, Guying of Established Trees;
 5. Part 4-2002, Lightning Protection Systems;
 6. ANSI Z133.1 – 1994 and most recent updates, Tree Care Operations – Safety Requirements
- D. Fertilizer and pesticide will be applied in strict accordance with the manufacturers label instructions and applicable federal, state, and local requirements. Fertilizer, soil conditioners, and pesticide applications must be approved by the owner prior to application. Safety Data Sheets (SDS) will be available for fertilizers and pesticides in the Contract Arborists' possession while on the site.
- E. Pre-Construction Meeting: Conduct meeting at the project site prior to commencement of construction related activities.
 1. Contract Arborist, Project Arborist, Project Design Team, Owner and Contractors shall attend.
 2. Review methods and procedures related to tree protection and preservation including, but not limited to, the following:
 - a. Site Logistics Plan
 - b. Construction schedule – verify availability of material, personnel, and equipment needed to make progress and avoid delays.
 - c. Enforcement of requirements for tree protection areas.
 - d. Responsibilities of all parties, including coordination, access and timing requirements.
 - e. Field quality control

1.6 PROJECT CONDITIONS

- A. The following practices are prohibited within all tree protection areas except as specifically indicated herein:
 1. Storage or stockpiling of construction materials, chemicals, debris, or excavation materials.
 2. Parking vehicles, trailers or equipment.
 3. Foot traffic.
 4. Erection of sheds or structures.

5. Impoundment or discharge of water.
 6. Excavation or other hand or mechanical digging unless otherwise indicated.
 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Temporary Tree Protection Fence
1. Chain-Link Fence: Follow requirements on fencing outlined in 01-5000 Temporary Facilities and in 01-1000 Summary.
- B. Wood Chip Mulch
1. Double ground hardwood, aged a minimum 6 months from production, free from deleterious materials. Green chips or mulch not aged at least 6 months shall not be used. No walnut mulch shall be used. Submittal shall include original material source(s), number and type of grindings / chippings, duration of aging, timing of turning / aeration.
- C. Hardwood Destruction Borer / Beetle Control: Bifenthrin, such as Onyx or equivalent. Applied per label.
- D. Tree Growth Regulator (*Paclobutrazol*)
1. Paclobutrazol is a compound used to regulate plant growth in such a way as to restrict canopy growth and free stored or produced energy for other uses in the tree. For highly impacted trees, this means more energy may be made available for fibrous root growth (to combat root loss), thicker darker leaves (allowing for increased photosynthesis, and increased drought tolerance), and pest suppression (often an issue with construction stressed trees); among countless other potential benefits. Trade name Cambistat® or equal.
- E. Soil Care/Soil Amendments
1. Fertilizer and soil amendment selection shall be based upon soil test results and recommendations.

PART 3 - EXECUTION

3.1 TREE REMOVAL

- A. See Section on Demolition for specifics on tree shrub or hedge removal.

3.2 TREE PROTECTION AND STRESS REDUCTION MEASURES

- A. General

1. Installation/implementation of the following measures shall be performed in the field by and ISA Certified Arborist as provided by the Contract Arborist
2. All work, substitutions and /or modifications shall be subject to review and approval by the Owner.
3. All work shall conform to applicable federal, state and local regulations and industry standards.
4. The Contract Arborist shall be responsible for all items in this section.

- B. Coordination of Tree preservation plan. The work of the Contract Arborist coordination to include but not limited to the following:

1. Existing underground utility marker conflicts brought to the attention of the Contractor for resolution as well uncovered underground utilities as a result of work.
2. Coordinate necessary survey layout of proposed construction elements in order to provide accurate locations for tree protection measures.
3. Layout location of designated tree protection based upon proposed construction and methods of construction for that area.
4. Site walk with Owner and Site Superintendent to verify location of all tree protection measures prior to execution.
5. Notify Site Superintendent and Owner if construction adjacent to tree protection does not appear to follow specifications or prior agreement or conflicts with tree protection seem eminent.
6. Coordinate with Site Superintendent and Owner, for access of deliveries, crews, equipment, start up, and cleanup of each item of work.
7. Provide "as built" of any change to location of tree protection.
8. Attend progress meetings as requested.
9. Provide submittals as required.

10. Notify Superintendent and Owner of any breach or damage to tree protection requiring attention.

C. Pruning and Supportive Cabling

1. Specific canopy pruning for tree health, risk reduction, and construction clearance per Contract documents
2. Size, health, species, and impact from proposed construction will be taken into consideration in determining pruning type for each designated tree. Risk Reduction Pruning will remove dead, dying, and declining limbs 2" diameter and larger. No interior green branching including sprouts will be removed unless approved by Contract Arborist.
3. Contractor, Contract Arborist, and Owner shall meet at site to determine overhead clearance conflicts between trees and construction equipment/activities to prevent breakage, impacts, or aesthetic concerns. All work shall conform to ANSI A-300 arboriculture standards. An aerial assessment shall be made for all trees climbed to report any structural weakness of concern to the Owner.
4. Prior to climbing any tree a risk assessment will be performed using visual, sounding, or basic drilling as needed by the Contract Arborist. Trees deemed high risk should not be climbed; alternate methods should be used and the tree reported to the Owner immediately.
5. Supportive Cabling of weak unions may be recommended by the Contract Arborist if the need is discovered during pruning operations. ANSI Standards apply. Cabling may be included only if submitted to the Engineer and approved by the Owner.

D. Root Prune

1. Purpose of the root pruning is to provide a more suitable cut so as to not rip or tear roots during excavations and grading with standard construction equipment. The exact location and depth along the LOD or edge of utility excavation will be determined during the layout by a Certified Arborist.
2. Root Pruning for urban sites with specimen trees or for transplanting requires the use of SSAT excavation for hand pruning. Refer to SSAT specifications in the section
3. Sufficient moisture is necessary for reducing the level of dust, increase work efficiency, and provide a hospitable environment of the tree roots and pedestrians.
4. At a pre-work site inspection by the Contract Arborist more than 72 hours in advance of work start, subsurface probing to 24-36" with a tile probe or similar method will determine if sufficient soil moisture exists. If sufficient moisture is not found, immediate coordination with the site managers shall be made to irrigate the proposed work areas. Methodology may be soaker hose, sprinklers, soaker

cans with small drilled holes to release water slowly or other methods. A second follow up inspection shall be made to determine final sufficiency to begin.

5. All root pruning operations shall be performed by the Contract Arborist and directed in the field by and ISA Certified Arborist with documented experience in similar SSAT excavation and root pruning.

E. Temporary Tree Protection Fence

1. Type and placement of fence to be designated on the Preservation Plans and Details.
2. Attach tree protection area signs at 30' feet spacing, facing construction activity. For fence lower than 6' feet in height, attach owner provided flagging as directed. Consult with the Owner for sign content.
3. Tree protection area signs shall be high visibility and all weather to last duration of the project / phase.
4. Install tree protection after root pruning if shown, and prior to all other mobilization such as demolition, clearing and/or excavation.
5. Install tree protection at 6" – 12" outside (construction side) of the Root Prune line or within the Root Prune Trench.
6. Silt fence will be outside (construction side) the tree protection fence, unless super silt fence is used in lieu of tree protection. Trenchless installation method shall be employed per Detail if Root Protection Matting is designated.
7. Exact placement of fence will be determined in walk-through with Contractor, Project Arborist, Contract Arborist, Engineer, and Owner.
8. Sequencing of the tree protection fence will be determined during the initial site walk. In any case, no construction activities shall occur in each phase or section until approved protection is installed.

F. Hand Excavation within Tree Protection Areas

1. For excavation within the critical root zone areas of trees to remain, the intent is to minimize tree and root damage from excavation activities.
2. Excavation shall be performed using SSAT, hand tools (shovels, etc.), or other approved non-damaging method. Roots shall not be damaged by the excavation except for approved root pruning.
3. Refer to "Supersonic Airtool Excavation" and "Construction Oversight by Arborist" specifications in this section for additional requirements.
4. All work shall be directly supervised by Contract Arborist in collaboration with the Owner's trades and subcontractors.

5. RPM (Root Protection Matting) shall be installed along trench sides to allow for temporary soil stockpile and access.
6. Excavate along the edge of the proposed trench closest to the trees to be protected as shown on the plans. Roots shall be uncovered and care taken to avoid damage to roots and bark.
7. Contract Arborist shall prune the exposed roots. Excavation shall not extend beyond the line where roots were pruned.
8. Contractor may proceed with conventional excavation methods or with hand excavation methods if clearance to the tree is inadequate for equipment access.
9. No roots shall be cut by the contractor.

G. Supersonic Airtool (SSAT) Excavation

1. Refer to "Hand Excavation within Tree Protection Areas" specification in this section for additional requirements
2. At a minimum, all SSAT work shall include the use of a barrier system such as temporary walls or tents to protect property and pedestrians from flying debris.
3. Excavate along the edge of the proposed trench closest to the trees to be protected as shown on the plans. Roots shall be uncovered and care taken to avoid damage to roots and bark.
4. Excavation shall proceed per the "Hand Excavation within Tree Protection Areas" specification in this section.

H. Wood Chip Mulch

1. Mulching for the duration of construction for protection and stress reduction. Mulching will increase moisture-holding capacity, minimize soil compaction, and increase needed organic composition. Mulch shall meet the specifications and shall be three (3) inches in depth.
2. For individual trees designated on the TPAK within the TPS or curvilinear TPA install mulch to a radius equal to trunk diameter inches equated to mulch ring diameter in feet (24" inch trunk diameter = 24' feet diameter mulch ring). Where planting pit areas are restricted by hardscape, mulch the greatest area possible.
3. For privately owned trees, any installation is contingent upon receipt of owner's permission. Owner may decline.
4. For linear TPAs along LOD Install mulch strips a minimum 10' feet wide the length of critical root zones along the outside of the LOD/Root Prune line (just inside the Tree Protection Zone) for designated significant trees impacted by proposed construction.

5. Motorized equipment shall not enter the Tree Protection Area (TPA) unless specifically approved by the Project Arborist and specific conditions met (RPM, AlturnaMATS, etc.). Any such motorized equipment shall be operated by a certified arborist while inside the TPA.
 6. Do not allow mulch to contact trunk / roof flare.
 7. Mulch depth shall be 3" inches.
- I. Tree Growth Regulator (*Paclobutrazol*)
1. Paclobutrazol is a compound used to regulate plant growth in such a way as to restrict canopy growth and free stored or produced energy for other uses in the tree. For highly impacted trees, this means more energy may be made available for fibrous root growth (to combat root loss), thicker darker leaves allowing for increased photosynthesis, and increased drought tolerance.
 2. Specific methods and dosages are contained on the label and are determined by size and species, and applied by a state licensed pesticide applicator. Designated trees are shown on the Tree Protection Action Key (TPAK).
- J. Supplemental Watering
1. This action is for high impact trees of significance during seasonal drought times of project construction. Based upon the number and size of trees various strategies can be considered to maintain adequate soil moisture during these times. These strategies may include but are not limited to the following:
 - a. Fire hydrant connection battery powered timer and drip irrigation hose/tubing;
 - b. Water tank trunk and hand applied as directed;
 - c. Temporary above grade poly tank with battery-powered timers for drip or soaker hoses at each TPA.
 - d. 30-50 gallon watering cans with 6 – 8 drilled holes in bottom to allow slow seeping of water; spacing and rotation to reach desired gallons. Equivalent means of affectively watering trees as approved by Engineer or Project Arborist.
 2. Trees requiring this treatment are indicated in the TPAK. Other trees will not receive this treatment.
 3. Drought times shall be defined as:
 - a. Periods during the growing season of two weeks or longer, where daytime high temperatures reach 80 degrees Fahrenheit or higher and less than $\frac{3}{4}$ " rainfall are recorded per week. Or,
 - b. Periods during the growing season designated as "abnormally dry" or "drought" of any severity, by the U.S. Drought Monitor: <http://droughtmonitor.unl.edu/> Or,
 - c. Any period of extraordinary circumstance, as determined by the project arborist or engineer

4. A prescription for the number of gallons and strategy for watering designated trees will be developed. Large mature trees with impacts to root systems require as much as 100 – 250 gallons per week during 90 degree days during summer drought times.
5. Periodic inspections by an ISA Certified Arborist (provided by the Contract Arborist) as this time are critical. Depth of moisture in soils shall be determined by soil sample tube or other exploratory means.
6. Minimum watering shall be considered to be 6 applications per growing season typically July through October with the exact timing and duration to be determined by the ISA Arborist.

K. Overhead Clearance

1. Trees to remain shall be assessed prior to construction for overhead clearance for construction activities. Contract Arborist shall recommend either canopy pruning, temporary guying/tying of select limbs, or alternative construction methods.
2. Pruning for clearance shall not remove branches above 12' feet or over 6" inches diameter
3. All pruning proposed by the Contractor and / or Contract Arborist shall first be reviewed and approved by the Owner and Project Arborist.
4. Equipment exhaust should be directed away from trees as much as possible. Stationary equipment shall not exhaust directly under or toward trees.
5. Contractor shall use appropriate equipment near trees to ensure that trees are not damaged by construction. Contractor shall provide any specialized equipment needed at no additional cost to the owner.
6. Any pruning shall also conform to the pruning specifications in this section.

L. Soil Tests and Soil Care/Fertilization

1. Initial soil testing within tree protection areas is required. Conduct individual soil tests for separate tree protection areas (small adjacent areas may be tested together). Soil test shall be a representative sample from each area. Soil testing shall include a texture analysis (sand, silt, and clay percentages), soluble salts, and sodium tests.
2. Treatments to the tree protection areas for specified trees (see TPAK) shall be based on the results of the soil analysis. Fertilization should be consistent with the recommendations of the ANSI A-300 (Part 2) Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Fertilization) 2004, except as described herein.
3. Application rates shall not exceed a rate of 1 pound of actual nitrogen per 1,000 square feet annually. Fertilizer used should include humic acids, soluble seaweed extracts and soil biological inoculants (mycorrhizae, etc.).

4. Applications to confined areas (i.e. street tree planting pits) should be made by soil injection. In areas where adequate application rates cannot be achieved, injection should be made to the point of refusal.

3.3 FIELD QUALITY CONTROL AND MONITORING

A. Tree Condition Monitoring

1. An ISA Certified Arborist (provided by the Contract Arborist) shall perform monitoring twice per month year round to monitor insects, disease, soil moisture levels, weather, and health changes on all trees designated on Tree Protection Action Key.
2. The monitoring will include a report that details problematic areas that have been addressed, treatments provided to reduce the problem, and anticipated treatments forecast for 30 days. This report will be forwarded to the Project Arborist, Engineer and Owner for documentation.
3. Any treatments recommended by the Contract Arborist not already included in the project scope shall be noted in the reports for review by the Project Arborist, Engineer and Owner. No additional work is to be performed unless approved in writing by the Owner.

B. Construction Oversight by Contract Arborist

1. Any work within CRZs of retained trees shall be directly supervised by the Contract Arborist.
2. If roots are encountered during excavation, work shall progress as directed by the Contract Arborist. Contract Arborist, in coordination with the construction and design teams, shall determine appropriate means and methods to address the roots. Options may include, but not be limited to, severing the roots, hand or SSAT excavation. Contractor shall not cut roots.
3. Refer to "Hand Excavation within Tree Protection Areas" specification in the section.
4. All work shall be documented thoroughly, including photo documentation. Refer to site documentation submittal requirements.

3.4 CONTRACTOR DAMAGE AND PENALTIES

A. Remedial Measures

1. Any damage caused to the trees by the work of this contract through negligence by the contractor shall be immediately remedied by the contractor. Contractor shall be responsible for any associated costs.

2. Remedial work may include pruning, cabling, or any other measures up to and including removal and replacement, as determined by the Project Arborist and Engineer.
3. Remedial work shall be performed by the Contract Arborist, as approved by the Project Arborist and Engineer.
4. All required remedial work shall be performed to the satisfaction of the Project Arborist and Engineer, at no additional cost to the owner.

B. Tree Replacement

1. If damage to any tree is severe, because of negligence by the contractor as determined by the Project Arborist and Engineer, it shall be replaced with a new tree of equal size caliper and species as that of the damaged tree.
2. If a replacement tree of equal size and caliper is not possible as determined by the Project Arborist and Engineer, it shall be replaced on and inch by inch basis with new trees of a minimum caliper size of 2"-3".
3. Replacement trees shall be supplied and installed at no additional costs to the owner, including all incidental costs including the costs of inspection of the tree at the nursery and any other incidental costs associated with tree replacement.

END OF SECTION 01 5640

SECTION 01 6000 - PRODUCT REQUIREMENTS

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. Work of this Section includes all labor, materials, equipment, and services necessary to complete product requirements as specified herein, including, but not limited to, the following:
 - 1. Product delivery, storage and handling.
 - 2. Storage and protection.
 - 3. Identifying markings.
 - 4. Temporary use of equipment.
 - 5. General standards.

1.3 RELATED SECTIONS

- A. Execution Requirements - Section 01 7000.

1.4 TRANSPORTATION AND HANDLING

- A. Materials, products, and equipment shall be properly containerized, packaged, boxed, and protected to prevent damage during transportation and handling.
- B. More detailed requirements for transportation and handling are specified under the technical Sections.

1.5 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 and to prevent overcrowding of construction spaces.
 - 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 materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 IDENTIFYING MARKINGS

- A. Name plates and other identifying markings shall not be affixed on exposed surfaces of manufactured items installed in finished spaces.

1.7 TEMPORARY USE OF EQUIPMENT

- A. No equipment intended for permanent installation shall be operated for temporary purposes without the written permission of the Architect.
- B. The temporary or trial usage by the Owner of any mechanical device, machinery, apparatus, equipment or any work or materials supplied under this Contract before final completion and written acceptance by the Architect, shall not be construed as evidence of the acceptance of same by the Owner. The Owner shall have the privilege of such temporary and trial usage, for such reasonable length of time as and when the Architect shall deem to be proper for making a complete and thorough test of same and no claim for damage shall be made by the Contractor for the injury to or breaking of parts of such work which may be caused by weakness or inaccuracy of structural parts or by defective

material or workmanship. If the Contractor so elects, he may at his own expense, place a competent person or persons to make such trial usage; such trial usage shall be under the supervision of the Contractor.

1.8 GENERAL REQUIREMENTS

- A. In the event that it is necessary for the Contractor to store any materials offsite, he shall first obtain the approval of the Architect. The Contractor shall be responsible for insurance and warehousing charges of any materials stored offsite. The Contractor shall also be responsible for the cost of delivery to the job site of any materials that have been stored offsite.
- B. Materials delivered to the job site shall be carefully stored and protected from damage. Damaged material shall not be used in the work. The Contractor shall provide, where directed temporary storage facilities as may be required for the storage of all materials which might be damaged by weather.
- C. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the representative manufacturers, unless otherwise specified.
- D. Equipment, plant, and appliances, such as hoists, centering, concrete lifts, construction elevators, cranes, rigging, towers, derricks, walks, ramps, chutes, scaffolding, implements, transportation, cartage and other things necessary and required for the adequate execution of the work and as required by law and applicable Union rules shall be provided and shall be maintained in good and safe mechanical working order, be responsible for their safe use, and remove them when no longer required. Applicable requirements of OSHA shall become and form a part of this document.
- E. During handling and installation of work at project site clean and protect work in progress and adjoining work on a basis of perpetual maintenance. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- F. To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period. Such exposures include (where applicable, but not by way of limitation) static loading, dynamic loading, internal pressures, external pressures, high or low temperatures, thermal shock, high or low humidity, air contamination or pollution, water, ice, solvents, chemicals, light, radiation, puncture, abrasion, heavy traffic, soiling, bacteria, insect infestation,

combustion, electrical current, high speed operation, improper lubrication, unusual wear, misuse, incompatible interface, destructive testing, misalignment, excessive weathering, unprotected storage, improper shipping/handling, theft and vandalism.

- G. Require installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- H. Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation to whatever extent these are more explicit or more stringent than applicable requirements indicated in the Contract Documents.
- I. Inspect each item of materials or equipment immediately prior to installation and reject damaged and defective items.
- J. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerance if not otherwise indicated. Allow for expansions and building movements. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual-effect choices to Architect for final decision.
- K. Recheck measurements and dimensions of the work as an integral step of starting each installation.
- L. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
- M. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.
- N. Mounting Heights: Except as otherwise indicated, mount individual units of work at industry-recognized standard mounting heights, for applications indicated. In CMU walls mount units at height closest to manufacturer's recommendation so as to minimize cutting of block coursings. Refer questionable mounting height choices to Architect for final decision.

END OF SECTION 01 6000

SECTION 01 7000 - EXECUTION REQUIREMENTS

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 general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.

1.3 RELATED SECTIONS

- A. Closeout Procedures - Section 01 7700.

1.4 SUBMITTALS

- A. Qualification Data: For land surveyor to demonstrate capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- D. Certified Surveys: Submit two copies signed by land surveyor.
- E. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. 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.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

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.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines and levels to which they must comply.

4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
- D. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 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.
 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.
- 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. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 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.
- G. 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.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg. F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
 - 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- I. 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.
- J. 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.
- K. Limiting Exposures: Supervise construction operations to ensure 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 operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Section 014000, "Quality Requirements."

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.

- C. Protect existing brick-paved sidewalk at adjoining residential tower development and those abutting Main Street and Park Avenue. Restore all areas of sidewalk damaged during construction to eliminate any evidence of damage.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 017329, "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7000

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 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 administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Warranties.
 - 4. Instruction of Owner's personnel.
 - 5. Final cleaning.

1.3 RELATED SECTIONS

- A. Execution Requirements - Section 01 7300.

1.4 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 8. Complete startup testing of systems.
 9. Submit test/adjust/balance records.
 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 11. Advise Owner of changeover in heat and other utilities.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Complete final cleaning requirements, including touchup painting.
 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. 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. A sample of the Certificate of Substantial Completion form is attached at the end of this section.
1. Reinspection: 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.

1.5 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 3. Submit pest-control final inspection report and warranty.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)
- A. Preparation: Submit digital copy of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
- 1.7 PROJECT RECORD DOCUMENTS
- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
1. 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 prepare the marked-up Record Prints.

- a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Note related Change Orders, Record Drawings and Product Data, where applicable.
- D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Drawings and Record Specifications, where applicable.
- E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.8 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" x 11" 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.

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.

PART 3 EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Provide instructors experienced in operation and maintenance procedures.
 - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 - 3. Schedule training with Owner with at least seven days' advance notice.
 - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.
- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
 - 1. System design and operational philosophy.
 - 2. Review of documentation.
 - 3. Operations.
 - 4. Adjustments.
 - 5. Troubleshooting.
 - 6. Maintenance.
 - 7. Repair.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
- b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- c. Rake grounds that are neither planted nor paved to a smooth, even textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1). Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to unusual operating conditions.

- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 7700

SECTION 02 4119 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes selective removal and subsequent offsite disposal of portions of existing building indicated on drawings and as required to accommodate new construction.

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: Detach items from existing construction and deliver them to Owner's designated storage area.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- C. 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 on-site operations are uninterrupted.

2. Interruption of utility services.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Use of elevator and stairs.
 5. Locations of temporary partitions and means of egress.
 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- E. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Professional Engineer Qualifications: Comply with Division 01 Section "Quality Requirements."
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Comply with applicable regulations, codes and ordinances.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:
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.
 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

1.6 PROJECT CONDITIONS

- A. Occupied Buildings:
1. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be

- disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
2. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- B. Owner assumes no responsibility for condition of areas to be selectively demolished. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
- C. Hazardous Materials: If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site will not be permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 2. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.

- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- 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. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Occupied Buildings: Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
 - 1. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
 - 1. Arrange with Owner to shut off indicated utilities.
 - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

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. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having

- jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
 3. Protect existing site improvements, appurtenances, and landscaping to remain.
- 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 furnishings, and equipment that have not been removed.
- C. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
- D. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
- E. Temporary Shoring: Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished. Strengthen or add new supports when required during progress of selective demolition.

3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
 2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on

adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION

- 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.
 3. 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.
 4. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 5. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, verify condition and contents before starting flame-cutting operations.
 6. Maintain portable fire-suppression devices during flame-cutting operations.
 7. Maintain adequate ventilation when using cutting torches.
 8. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 9. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 10. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 11. Dispose of demolished items and materials promptly.
 12. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items: Comply with the following:
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: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 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 reinstalled in their original locations after selective demolition operations are complete.

3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing concrete or masonry that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of

3.8 SELECTIVE DEMOLITION SCOPE

- A. Refer to the drawings.

END OF SECTION 024119

SECTION 02 8216 - ASBESTOS ABATEMENT

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 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. Girls Inc. (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 Girls Inc.
- E. Specification Section 02 8216 was produced by EnviroMed Services, Inc., John Luby – CT Licensed Asbestos Project Designer #19.
- F. 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.
- G. 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.
- H. 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.

1.3 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. Contractor shall remove the following asbestos-containing materials at the Girls Inc. Building as depicted on Drawing H101:

<u>Material</u>	<u>Quantity</u>	<u>Location</u>
Vinyl Floor Tile & Mastic	220 SF	Mech 115 – 1 st Floor
Flex Duct Connectors	2 EA	Mech 115 – 1 st Floor
Mudded Pipe Fitting Insulation	2 LF	Training 120 – 1 st Floor

1.4 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 greater than or equal to 1.0 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 greater than or equal to 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 greater than or equal to 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 1/2" 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 greater than or equal to 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 than 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 greater than or equal to 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.

1.5 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.

1.6 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 Notification
EPA Notification
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) working 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
 - b. Asbestos Demo/Reno Notifications
US EPA Region 1
5 Post Office Square, Mail Code OES05-4
Boston, MA 02109-3912
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

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

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.

1.8 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.

1.9 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.

1.10 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 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.

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:

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.

- C. Allow 21 calendar days for the processing of written requests for Alternate Work Practices by the Owner and associated review parties. Alternate Work Practices may not be utilized without Owner approval.
- D. Written requests for Alternate Work Practices must be accompanied by a written itemized credit proposal to the Owner detailing the labor and material costs that will be credited to the Contract if the Alternate Work Practice is approved. Written requests for Alternate Work Practices must be accompanied by a written assessment of the schedule impact of utilizing the proposed Alternate Work Practice.
- E. Girls Inc. reserves the right to reject any proposed Alternative Work Practice without cause.
- F. The Contractor shall be responsible for all fees associated with filing Alternative Work Practice (AWP) applications. Submission of AWP applications requires a Connecticut DPH Asbestos Project Designer license. The Contractor is responsible for retaining a licensed Asbestos Project Designer to prepare the Alternate Work Practice. The licensed Asbestos Project Designer that prepares the Alternate Work Practice may not

be an employee of the Contractor or an employee of a Subcontractor under contract with the Contractor.

- G. Submit written requests for Alternate Work Practices to the Owner.

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	<u>Pre- Abatement</u>	<u>During Abatement</u>	<u>Post- Abatement</u>
Greater than 500 l.f. or 1500 s.f.	PCM	PCM	TEM
Equal to or less than 500 l.f. or 1500 s.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 equalling 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 12 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 02 8233 - LEAD ABATEMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. Action Level: Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) calculated as an eight hour time weighted average.
- B. Competent Person: An individual capable of identifying existing lead hazards and taking corrective measures to eliminate them. The duties of the competent person include at least the following: controlling entry to and exit from the lead abatement area, ensuring contract compliance, conducting personal air monitoring, ensuring that all employees working within the lead abatement area have lead awareness training, and ensuring that lead abatement workers use the hand washing facilities.
- C. Lead Based Paint: Paint found to contain greater than or equal to 1.0 milligrams of lead per square centimeter of paint area by XRF testing.
- D. Permissible Exposure Limit (PEL): Fifty (50) micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air averaged over an 8 hour period as determined by 29 CFR 1926.62.
- E. Personal Monitoring: Sampling of lead concentrations within the breathing zone of a worker to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employee's work tasks.
- F. Toxicity Characteristic Leaching Procedure (TCLP): Toxicity characteristic leaching procedure utilizing EPA Test method SW-846, Method 1311.

1.3 GENERAL

- A. Scope: Paint removal, painted component removal, paint prep, drilling & cutting through painted components and disposal in support of renovations to Girls Inc. Location of lead-based paint in the building is documented in Drawings H100, H101, H102, H103, H120, H200, & H203; and in the attached lead testing XRF data.
- B. Intent: The intent of this specification is to assist the Contractor in complying with the OSHA Construction Industry Standard for Lead (29 CFR Part 1926.62) and State DEEP regulations for waste disposal during renovations at Girls Inc.

- C. OSHA Compliance: Contractor is responsible for compliance with the OSHA Construction Industry Standard for Lead (29 CFR Part 1926.62) when conducting renovation activities at Girls Inc. Contractor is to maintain a copy of 29 CFR 1926.62 on site. OSHA regulates the disturbance of paint containing any measurable lead content.
- D. Notification: Contractor shall obtain a small quantity hazardous waste generator ID number from the State DEEP for the site.

1.4 LEAD PAINT IDENTIFICATION

- A. Toxic (≥ 1 mg/cm²) levels of lead are identified on the drawings and in the attached lead XRF data.

1.5 DEBRIS DISPOSAL

- A. The following materials shall be disposed of as hazardous lead waste with a TCLP reading >5 mg/l:
 - Paint chips
 - Painted wood
 - Painted wallboard

1.6 EMPLOYEE EXPOSURE ASSESSMENT

- A. Conduct lead dust air sampling to assure that workers are protected in accordance with all applicable Federal, State, and Local regulations. Documentation of air sampling results must be recorded at the work site within five (5) working days and shall be available for review until the job is complete.

1.7 WORKER HAND WASHING FACILITY

- A. Establish a lead abatement worker hand washing facility consisting of running potable water, a wash basin, hand cleaning cream, and towels.
- B. All lead abatement workers shall wash their hands and face prior to taking breaks, going to lunch, and leaving the site at the end of the work day.

1.8 WORKER PROTECTION PROCEDURES

- A. Workers shall not eat, drink, smoke, or chew gum or tobacco while in the lead abatement area.

1.9 WORKER TRAINING REQUIREMENT

- A. All Contractor employees on the job site are required to be trained regarding any hazardous materials, including lead, they may be exposed to at the work site and

health and safety hazards at the work site. Training shall meet the requirements of the Hazard Communication Standard (29 CFR 1926.59) and Safety Training and Education Standard (29 CFR 1926.21).

- B. All workers impacting lead-containing building materials shall receive at least 4 hours of lead awareness training meeting the requirements of 29 CFR 1926.62. Documentation of said training is to be kept on-site in a binder for review. The awareness training must be dated within one year of the project.

1.10 COMPETENT PERSON

- A. Maintain a competent person on site for the duration of lead abatement.

1.11 LEAD ABATEMENT PLAN

- A. Prior to construction, in compliance with the OSHA Lead Standard, prepare a written description of lead abatement activities planned detailing methods, equipment, engineering controls, crew size, employee job responsibilities, operating and maintenance procedures.
- B. Submit a copy of the Lead Abatement Plan to the A/E for review. Maintain a copy on site during construction.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 PAINT DISTURBANCE METHODS

- A. Equip tools used to drill, cut, or sand surfaces painted with lead-based paint with HEPA vacuum cowled dust collection.
- B. Restrict access to rooms where lead paint disturbance is taking place to persons with lead awareness training.

3.2 PAINT DISPOSAL

- A. Barrel paint chips, painted wood, and painted wallboard in 55 gallon steel drums.
- B. Label steel drums as containing hazardous lead waste.
- C. Transport and dispose of removed paint as hazardous lead waste.
- D. Return completed waste manifest for disposal of paint waste to Construction Manager.

Girls Inc

EnviroMed Services
470 Murdock Ave, Meriden, CT

INSPECTION SITE: 130 Lincoln Street, Meriden, CT
INSPECTION DATE: 1/31/2024 - 2/8/2024
INSTRUMENT TYPE: Viken Detection
Pb200i XRF Lead Paint Analyzer
2575
ACTION LEVEL: 1.0 (mg/cm²)
Job ID: girls inc
STATEMENT: Limited Lead Screening

Girls Inc

Inspection Site: 130 Lincoln Street, Meriden, CT

Inspection Date: 1/31/2024 - 2/8/2024

Action Level: 1.0 (mg/cm²)

Total Readings: 481

Unit Started: 01/31/2024 10:54:25

Unit Ended: 02/08/2024 14:40:07

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2558	(CAL)									1.0 mg/cm ²
2559	(CAL)									1.1 mg/cm ²
2560	(CAL)									1.0 mg/cm ²
2561	Negative	Attic Storage	Room	Wall	Drywall	A	300	Beige	Deteriorated	0.4 mg/cm ²
2562	Negative	Attic Storage	Room	Wall	Drywall	C	300	Beige	Intact	0.3 mg/cm ²
2563	Negative	Attic Storage	Room	Wall	Drywall	B	300	Beige	Intact	0.4 mg/cm ²
2564	Negative	Attic Storage	Room	Wall	Drywall	D	300	Beige	Intact	0.3 mg/cm ²
2565	Negative	Attic Storage	Room	Ceiling	Drywall		300	Beige	Intact	0.3 mg/cm ²
2566	Negative	Attic Storage	Room	Ceiling	Drywall		300	Beige	Intact	0.2 mg/cm ²
2567	Negative	Attic Closet	Room	Ceiling	Drywall		303	Beige	Intact	0.3 mg/cm ²
2568	Negative	Attic Closet	Room	Ceiling	Drywall	B	303	Beige	Intact	0.4 mg/cm ²
2569	Negative	Attic Closet	Room	Ceiling	Drywall	D	303	Beige	Intact	0.4 mg/cm ²
2570	Positive	Attic Closet	Room	Baseboard	Wood	D	303	Beige	Intact	29.3 mg/cm ²
2571	Positive	Attic Storage	Room	Baseboard	Wood	C	300	Beige	Intact	27.6 mg/cm ²
2572	Positive	Attic Storage	Room	Baseboard	Wood	B	300	Beige	Intact	28.0 mg/cm ²
2573	Positive	Attic Storage	Room	Baseboard	Wood	D	300	Beige	Intact	25.5 mg/cm ²
2574	Positive	Attic Storage	Room	Wall	Drywall	A	304	Beige	Deteriorated	3.9 mg/cm ²
2575	Positive	Attic Storage	Room	Wall	Drywall	A	304	Beige	Intact	5.4 mg/cm ²
2576	Positive	Attic Storage	Room	Wall	Drywall	B	304	Beige	Intact	2.6 mg/cm ²
2577	Positive	Attic Storage	Room	Wall	Drywall	D	304	Beige	Intact	4.6 mg/cm ²
2578	Negative	Attic Storage	Room	Ceiling	Drywall		304	Beige	Intact	0.2 mg/cm ²
2579	Positive	Attic Storage	Room	Baseboard	Wood	A	304	Beige	Intact	5.4 mg/cm ²
2580	Positive	Attic Storage	Room	Baseboard	Wood	D	304	Beige	Intact	5.2 mg/cm ²
2581	Positive	Attic Storage	Room	Baseboard	Wood	B	304	Beige	Intact	5.3 mg/cm ²
2582	Negative	Attic Storage	Room	Ceiling	Drywall		304	Beige	Intact	0.2 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Licoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2583	Positive	Attic Storage	Room	Wall	Drywall	A	305	Beige	Deteriorated	2.1 mg/cm ²
2584	Positive	Attic Storage	Room	Wall	Drywall	C	305	Beige	Intact	3.8 mg/cm ²
2585	Positive	Attic Storage	Room	Wall	Drywall	B	305	Beige	Intact	2.9 mg/cm ²
2586	Positive	Attic Storage	Room	Wall	Drywall	D	305	Beige	Intact	3.2 mg/cm ²
2587	Negative	Attic Storage	Room	Ceiling	Drywall		305	Beige	Deteriorated	0.2 mg/cm ²
2588	Positive	Attic Storage	Room	Baseboard	Wood	C	305	Beige	Intact	5.3 mg/cm ²
2589	Positive	Attic Storage	Room	Baseboard	Wood	A	305	Beige	Intact	3.6 mg/cm ²
2590	Negative	Attic Storage	Room	Wall	Drywall	C	305	Beige	Deteriorated	0.2 mg/cm ²
2591	Negative	Attic Storage	Room	Wall	Drywall	A	305	Beige	Deteriorated	0.2 mg/cm ²
2592	Negative	Attic Storage	Room	Wall	Drywall	B	305	Beige	Deteriorated	0.8 mg/cm ²
2593	Negative	Attic Storage	Room	Wall	Drywall	D	305	Beige	Deteriorated	0.6 mg/cm ²
2594	Negative	Attic Storage	Room	Ceiling	Drywall		305	Beige	Deteriorated	0.4 mg/cm ²
2595	Positive	Attic Storage	I-Beam		Wood		305	Blue	Intact	25.2 mg/cm ²
2596	Negative	Attic Storage	Closet	Wall	Drywall		305	Beige	Intact	0.3 mg/cm ²
2597	Positive	Attic Storage	Room	Baseboard	Wood		305	Beige	Intact	23.6 mg/cm ²
2598	Negative	Attic Hallway	Room	Ceiling	Drywall		302	Beige	Deteriorated	0.0 mg/cm ²
2599	Negative	Attic Hallway	Room	Ceiling	Wood		302	White	Deteriorated	0.1 mg/cm ²
2600	Positive	Attic Hallway	Room	Wall	Drywall	C	302	Beige	Deteriorated	2.7 mg/cm ²
2601	Positive	Attic Hallway	Room	Wall	Drywall	B	302	Beige	Deteriorated	4.5 mg/cm ²
2602	Positive	Attic Hallway	Room	Wall	Drywall	D	302	Beige	Deteriorated	3.0 mg/cm ²
2603	Positive	Attic Hallway	Room	Wall	Drywall	A	302	Beige	Deteriorated	5.8 mg/cm ²
2604	Negative	Attic Hallway	Room	Ceiling	Drywall	A	302	Beige	Intact	0.3 mg/cm ²
2605	Positive	Attic Hallway	Room	Baseboard	Wood	B	302	Beige	Intact	4.1 mg/cm ²
2606	Positive	Attic Hallway	Room	Baseboard	Wood	C	302	Beige	Intact	4.0 mg/cm ²
2607	Positive	Attic Hallway	Room	Baseboard	Wood	D	302	Beige	Intact	3.5 mg/cm ²
2608	Negative	Attic Stairs	Room	Ceiling	Drywall		301	White	Deteriorated	0.9 mg/cm ²

Girls Inc

Inspection Site: 130 Licoln Street, Meriden, CT

Inspection Date: 1/31/2024 - 2/8/2024

Action Level: 1.0 (mg/cm²)

Total Readings: 481

Unit Started: 01/31/2024 10:54:25

Unit Ended: 02/08/2024 14:40:07

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2609	Positive	Attic Stairs	Room	Ceiling	Drywall		301	White	Deteriorated	1.0 mg/cm ²
2610	Positive	Attic Stairs	Room	Baseboard	Wood	B	301	Green	Intact	13.3 mg/cm ²
2611	Positive	Attic Stairs	Room	Baseboard	Wood	C	301	Green	Intact	11.0 mg/cm ²
2612	Positive	Attic Stairs	Room	Baseboard	Wood	C	301	Green	Intact	14.8 mg/cm ²
2613	Positive	Attic Stairs	Stair	Wall	Wood	D	301	Green	Intact	10.8 mg/cm ²
2614	Positive	Attic Stairs	Stair	Wall	Wood	B	301	Green	Intact	13.8 mg/cm ²
2615	Positive	Attic Stairs	Stair	Wall	Wood	C	301	Green	Intact	13.7 mg/cm ²
2616	Positive	Attic Stairs	Stair	Wall	Wood	A	301	Green	Intact	16.2 mg/cm ²
2617	Positive	Attic Stairs	Room	Baseboard	Wood	D	301	Green	Intact	14.1 mg/cm ²
2618	Negative	Hallway	Room	Wall	Drywall	A	202	Beige	Intact	0.5 mg/cm ²
2619	Negative	Hallway	Room	Wall	Drywall	C	202	Beige	Intact	0.3 mg/cm ²
2620	Negative	Hallway	Room	Wall	Drywall	D	202	Beige	Intact	0.4 mg/cm ²
2621	Negative	Hallway	Room	Wall	Drywall	B	202	Beige	Intact	0.4 mg/cm ²
2622	Positive	Hallway	Room	Baseboard	Wood	A	202	White	Intact	18.0 mg/cm ²
2623	Positive	Hallway	Room	Baseboard	Wood	C	202	White	Intact	14.2 mg/cm ²
2624	Positive	Hallway	Room	Baseboard	Wood	D	202	White	Intact	28.0 mg/cm ²
2625	Positive	Hallway	Room	Baseboard	Wood	B	202	White	Intact	12.1 mg/cm ²
2626	Negative	Hallway	Room	Ceiling	Drywall		202	White	Intact	0.0 mg/cm ²
2627	Positive	Hallway	Door Trim	Door Trim	Wood		202	White	Intact	4.0 mg/cm ²
2628	Positive	Hallway	Door Trim	Door Trim	Wood		202	White	Intact	3.9 mg/cm ²
2629	Positive	Hallway	Door	Jamb	Wood	A	202	White	Intact	21.9 mg/cm ²
2630	Positive	Hallway	Door	Casing	Wood	A	202	White	Intact	19.9 mg/cm ²
2631	Positive	Hallway	Door	Header	Wood	A	202	White	Intact	18.5 mg/cm ²
2632	Positive	Classroom	Room	Wall	Drywall	A	206	Green	Intact	12.8 mg/cm ²
2633	Negative	Classroom	Room	Wall	Drywall	C	206	Green	Intact	0.4 mg/cm ²
2634	Positive	Classroom	Room	Wall	Drywall	D	206	Green	Intact	3.4 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Licoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2635	Positive	Classroom	Room	Wall	Drywall	B	206	Yellow	Intact	12.4 mg/cm ²
2636	Positive	Classroom	Room	Baseboard	Wood	A	206	White	Intact	15.4 mg/cm ²
2637	Positive	Classroom	Room	Baseboard	Wood	C	206	White	Intact	13.4 mg/cm ²
2638	Positive	Classroom	Room	Baseboard	Wood	B	206	White	Intact	8.7 mg/cm ²
2639	Positive	Classroom	Room	Baseboard	Wood	D	206	White	Intact	8.2 mg/cm ²
2640	Negative	Classroom	Room	Ceiling	Drywall		206	White	Intact	0.3 mg/cm ²
2641	Negative	Classroom	Beam	Underside	Drywall		206	Beige	Intact	0.6 mg/cm ²
2642	Positive	Classroom	Window	Casing	Wood	A	206	White	Intact	18.2 mg/cm ²
2643	Negative	Classroom	Window	Sill	Wood	A	206	White	Intact	0.1 mg/cm ²
2644	Negative	Classroom	Window	Sash	Wood	A	206	White	Intact	0.2 mg/cm ²
2645	Positive	Classroom	Door	Casing	Wood	C	206	White	Intact	22.3 mg/cm ²
2646	Positive	Classroom	Door	Jamb	Wood	C	206	White	Intact	20.6 mg/cm ²
2647	Positive	Kitchen	Room	Wall	Drywall	A	208	Beige	Intact	7.9 mg/cm ²
2648	Positive	Kitchen	Room	Wall	Drywall	C	208	Beige	Intact	5.5 mg/cm ²
2649	Positive	Kitchen	Room	Wall	Drywall	D	208	Beige	Intact	8.7 mg/cm ²
2650	Positive	Kitchen	Room	Wall	Drywall	B	208	Beige	Intact	5.3 mg/cm ²
2651	Positive	Kitchen	Room	Wall	Porcelain	A	208	Beige	Intact	5.8 mg/cm ²
2652	Positive	Kitchen	Room	Wall	Porcelain	C	208	Beige	Intact	5.8 mg/cm ²
2653	Positive	Kitchen	Room	Wall	Porcelain	B	208	Beige	Intact	6.0 mg/cm ²
2654	Positive	Kitchen	Room	Wall	Porcelain	D	208	Beige	Intact	6.9 mg/cm ²
2655	Positive	Kitchen	Room	Baseboard	Wood	A	208	White	Intact	11.1 mg/cm ²
2656	Positive	Kitchen	Room	Baseboard	Wood	C	208	White	Intact	13.5 mg/cm ²
2657	Positive	Kitchen	Room	Baseboard	Wood	B	208	White	Intact	13.5 mg/cm ²
2658	Positive	Kitchen	Window	Casing	Wood	D	208	White	Intact	13.1 mg/cm ²
2659	Positive	Kitchen	Door	Jamb	Wood	A	208	White	Intact	32 mg/cm ²
2660	Positive	Kitchen	Door	Buck	Wood	A	208	White	Intact	20.3 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2661	Positive	Kitchen	Room	Ceiling	Drywall		208	White	Intact	9.0 mg/cm ²
2662	Positive	Classroom	Room	Wall	Drywall	A	213	Blue	Intact	14.8 mg/cm ²
2663	Positive	Classroom	Room	Wall	Drywall	C	213	Gray	Intact	1.0 mg/cm ²
2664	Positive	Classroom	Room	Wall	Drywall	B	213	Gray	Intact	1.2 mg/cm ²
2665	Positive	Classroom	Room	Wall	Drywall	D	213	Gray	Intact	15.8 mg/cm ²
2666	Positive	Classroom	Room	Baseboard	Wood	A	213	White	Intact	26.6 mg/cm ²
2667	Positive	Classroom	Room	Baseboard	Wood	C	213	White	Intact	18.2 mg/cm ²
2668	Positive	Classroom	Room	Baseboard	Wood	B	213	White	Intact	10.5 mg/cm ²
2669	Positive	Classroom	Room	Baseboard	Wood	D	213	White	Intact	19.5 mg/cm ²
2670	Positive	Classroom	Door	Casing	Wood	C	213	White	Intact	14.1 mg/cm ²
2671	Positive	Classroom	Door	Jamb	Wood	C	213	White	Intact	9.3 mg/cm ²
2672	Positive	Classroom	Window	Casing	Wood	B	213	White	Intact	13.4 mg/cm ²
2673	Positive	Classroom	Window	Sill	Wood	B	213	White	Intact	11.0 mg/cm ²
2674	Positive	Classroom	Pipe	Vertical	Metal		213	Gray	Intact	6.8 mg/cm ²
2675	Negative	Classroom	Room	Ceiling	Vinyl		213	Gray	Intact	0.3 mg/cm ²
2676	Positive	Classroom	Room	Crown Molding	Wood		213	Gray	Intact	1.2 mg/cm ²
2677	Negative	Classroom	Room	Wall	Drywall	A	203	Yellow	Intact	0.4 mg/cm ²
2678	Positive	Classroom	Room	Wall	Drywall	C	203	Yellow	Intact	19.4 mg/cm ²
2679	Positive	Classroom	Room	Wall	Drywall	D	203	Yellow	Intact	16.5 mg/cm ²
2680	Positive	Classroom	Room	Wall	Drywall	B	203	Gray	Intact	14.6 mg/cm ²
2681	Positive	Classroom	Room	Baseboard	Wood	C	203	White	Intact	11.9 mg/cm ²
2682	Positive	Classroom	Room	Baseboard	Wood	D	203	White	Intact	11.8 mg/cm ²
2683	Positive	Classroom	Fire Place	Mantle	Wood	C	203	White	Intact	14.7 mg/cm ²
2684	Negative	Classroom	Fire Place	Frame	Brick	C	203	White	Intact	0.3 mg/cm ²
2685	Negative	Classroom	Room	Ceiling	Vinyl	C	203	Gray	Intact	0.1 mg/cm ²
2686	Positive	Classroom	Room	Crown Molding	Wood	C	203	Gray	Intact	1.1 mg/cm ²

Girls Inc

Inspection Site: 130 Licoln Street, Meriden, CT

Inspection Date: 1/31/2024 - 2/8/2024

Action Level: 1.0 (mg/cm²)

Total Readings: 481

Unit Started: 01/31/2024 10:54:25

Unit Ended: 02/08/2024 14:40:07

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2687	Positive	Toilet	Room	Wall	Ceramic	A	204	Yellow	Intact	1.4 mg/cm ²
2688	Positive	Toilet	Room	Wall	Ceramic	C	204	Yellow	Intact	1.5 mg/cm ²
2689	Positive	Toilet	Room	Wall	Ceramic	A	204	Yellow	Intact	1.4 mg/cm ²
2690	Negative	Toilet	Room	Floor	Ceramic		204	Yellow	Intact	0.2 mg/cm ²
2691	Positive	Toilet	Window	Sill	Wood	B	204	White	Intact	1.2 mg/cm ²
2692	Negative	Toilet	Room	Ceiling	Vinyl	B	204	White	Intact	0.3 mg/cm ²
2693	Negative	Toilet	Room	Crown Molding	Wood		204	White	Intact	0.1 mg/cm ²
2694	Positive	Room	Room	Wall	Plaster	A	207	Gray	Intact	4.4 mg/cm ²
2695	Positive	Room	Room	Wall	Plaster	C	207	Gray	Intact	3.0 mg/cm ²
2696	Positive	Room	Room	Wall	Plaster	B	207	Gray	Intact	4.0 mg/cm ²
2697	Positive	Room	Room	Wall	Plaster	D	207	Gray	Intact	4.5 mg/cm ²
2698	Positive	Room	Room	Baseboard	Wood	A	207	White	Intact	13.4 mg/cm ²
2699	Negative	Room	Room	Baseboard	Wood	C	207	White	Intact	0.3 mg/cm ²
2700	Positive	Room	Door	Casing	Wood	C	207	White	Intact	11.8 mg/cm ²
2701	Positive	Room	Room	Ceiling	Drywall		207	White	Intact	2.0 mg/cm ²
2702	Positive	Toilet	Room	Wall	Drywall	A	209	Gray	Intact	3.8 mg/cm ²
2703	Positive	Toilet	Room	Wall	Drywall	C	209	Gray	Intact	4.4 mg/cm ²
2704	Negative	Toilet	Room	Ceiling	Drywall		209	White	Intact	0.3 mg/cm ²
2705	Positive	Toilet	Room	Baseboard	Wood	B	209	White	Intact	33 mg/cm ²
2706	Positive	Toilet	Room	Baseboard	Wood	D	209	White	Intact	9.7 mg/cm ²
2707	Negative	Toilet	Window	Casing	Wood	A	209	White	Intact	0.6 mg/cm ²
2708	Positive	Hallway	Room	Wall	Drywall	B	211	Gray	Intact	5.9 mg/cm ²
2709	Positive	Hallway	Room	Wall	Drywall	D	211	Gray	Intact	3.5 mg/cm ²
2710	Positive	Hallway	Room	Baseboard	Wood	B	211	White	Intact	4.4 mg/cm ²
2711	Positive	Hallway	Room	Baseboard	Wood	D	211	White	Intact	24.5 mg/cm ²
2712	Negative	Hallway	Door	Jamb	Wood	D	211	White	Intact	0.1 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2713	Positive	Hallway	Door	Casing	Wood	D	211	White	Intact	21.5 mg/cm ²
2714	Negative	Hallway	Door	Frame	Wood	D	211	White	Intact	0.2 mg/cm ²
2715	Positive	Hallway	Cabinets	Door	Wood	C	211	Beige	Intact	22.6 mg/cm ²
2716	Negative	Hallway	Room	Ceiling	Drywall		211	White	Intact	0.6 mg/cm ²
2717	Negative	Office	Room	Wall	Drywall	A	210	Green	Intact	0.6 mg/cm ²
2718	Negative	Office	Room	Wall	Drywall	C	210	Green	Intact	0.7 mg/cm ²
2719	Negative	Office	Room	Wall	Drywall	D	210	Green	Intact	0.6 mg/cm ²
2720	Negative	Office	Room	Wall	Drywall	B	210	Green	Intact	0.5 mg/cm ²
2721	Positive	Office	Room	Ceiling	Drywall		210	White	Intact	1.6 mg/cm ²
2722	Positive	Office	Room	Crown Molding	Wood		210	White	Intact	11.3 mg/cm ²
2723	Positive	Office	Room	Baseboard	Wood	B	210	White	Intact	32 mg/cm ²
2724	Positive	Office	Room	Baseboard	Wood	D	210	White	Intact	3.4 mg/cm ²
2725	Positive	Office	Window	Casing	Wood	D	210	White	Intact	33 mg/cm ²
2726	Positive	Office	Window	Sill	Wood	D	210	White	Intact	14.2 mg/cm ²
2727	Positive	Office	Closet	Door	Wood	C	210	White	Intact	28.0 mg/cm ²
2728	Positive	Office	Closet	Jamb	Wood	C	210	White	Intact	31 mg/cm ²
2729	Positive	Office	Closet	Frame	Wood	C	210	White	Intact	32 mg/cm ²
2730	Positive	Gathering	Room	Wall	Drywall	C	103	Yellow	Intact	15.3 mg/cm ²
2731	Positive	Gathering	Room	Wall	Drywall	B	103	Yellow	Intact	17.4 mg/cm ²
2732	Positive	Gathering	Room	Wall	Drywall	D	103	Yellow	Intact	3.0 mg/cm ²
2733	Positive	Gathering	Fire Place	Mantle	Wood	B	103	White	Intact	22.1 mg/cm ²
2734	Positive	Gathering	Fire Place	Frame	Wood	B	103	White	Intact	10.0 mg/cm ²
2735	Positive	Gathering	Room	Baseboard	Wood	B	103	White	Intact	28.3 mg/cm ²
2736	Positive	Gathering	Room	Baseboard	Wood	D	103	White	Intact	7.7 mg/cm ²
2737	Positive	Gathering	Column		Wood		103	White	Intact	31 mg/cm ²
2738	Positive	Gathering	Door	Casing	Wood	D	103	White	Intact	26.4 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Licoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2739	Positive	Gathering	Door	Jamb	Wood	D	103	White	Intact	24.7 mg/cm ²
2740	Positive	Gathering	Door	Buck	Wood	D	103	White	Intact	28.1 mg/cm ²
2741	Positive	Gathering	Radiator	Cover	Wood	C	103	White	Intact	1.5 mg/cm ²
2742	Positive	Gathering	Room	Ceiling	Plaster		103	Tan	Intact	4.3 mg/cm ²
2743	Positive	Office	Room	Wall	Drywall	A	104	Brown	Intact	11.5 mg/cm ²
2744	Negative	Office	Room	Wall	Drywall	C	104	Brown	Intact	0.2 mg/cm ²
2745	Positive	Office	Room	Wall	Drywall	B	104	Brown	Intact	11.5 mg/cm ²
2746	Positive	Office	Room	Wall	Drywall	D	104	Brown	Intact	15.9 mg/cm ²
2747	Positive	Office	Room	Wall	Wood	D	104	White	Intact	3.2 mg/cm ²
2748	Positive	Office	Room	Wall	Wood	B	104	White	Intact	5.1 mg/cm ²
2749	Positive	Office	Room	Baseboard	Wood	D	104	White	Intact	10.4 mg/cm ²
2750	Positive	Office	Room	Baseboard	Wood	B	104	White	Intact	9.3 mg/cm ²
2751	Negative	Office	Fire Place	Mantle	Wood	C	104	Green	Intact	0.5 mg/cm ²
2752	Positive	Office	Fire Place	Frame	Wood	C	104	Green	Intact	3.0 mg/cm ²
2753	Positive	Office	Radiator	Cover	Metal	A	104	White	Intact	1.0 mg/cm ²
2754	Positive	Office	Window	Sill	Wood	A	104	White	Intact	19.6 mg/cm ²
2755	Positive	Office	Window	Casing	Wood	A	104	White	Intact	24.9 mg/cm ²
2756	Negative	Office	Room	Ceiling	Plaster		104	White	Intact	0.2 mg/cm ²
2757	Positive	Office	Room	Crown Molding	Wood	A	104	White	Intact	1.1 mg/cm ²
2758	Negative	Kitchen	Room	Wall	Drywall	A	105	Blue	Intact	0.1 mg/cm ²
2759	Positive	Kitchen	Room	Wall	Drywall	C	105	Blue	Intact	4.2 mg/cm ²
2760	Negative	Kitchen	Room	Wall	Drywall	D	105	Blue	Intact	0.2 mg/cm ²
2761	Positive	Kitchen	Room	Wall	Drywall	B	105	Blue	Intact	4.7 mg/cm ²
2762	Positive	Kitchen	Room	Baseboard	Wood	A	105	White	Intact	5.4 mg/cm ²
2763	Negative	Kitchen	Room	Baseboard	Wood	C	105	White	Intact	0.1 mg/cm ²
2764	Positive	Kitchen	Fire Place	Mantle	Wood	A	105	White	Intact	26.7 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
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 Unit Started: 01/31/2024 10:54:25
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Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2765	Positive	Kitchen	Fire Place	Frame	Brick	A	105	Black	Intact	9.1 mg/cm ²
2766	Negative	Kitchen	Radiator		Metal	D	105	Tan	Intact	0.2 mg/cm ²
2767	Positive	Kitchen	Window	Casing	Wood	D	105	White	Intact	35 mg/cm ²
2768	Positive	Kitchen	Window	Sill	Wood	D	105	White	Intact	30.0 mg/cm ²
2769	Positive	Kitchen	Room	Ceiling	Drywall		105	Tan	Intact	30.0 mg/cm ²
2770	Negative	Kitchen	Door		Wood	D	105	White	Intact	0.2 mg/cm ²
2771	Negative	Kitchen	Door	Casing	Wood	D	105	White	Intact	0.1 mg/cm ²
2772	Positive	Pantry	Room	Wall	Drywall	D	106	Gray	Intact	1.2 mg/cm ²
2773	Positive	Pantry	Room	Wall	Drywall	A	106	Gray	Intact	1.8 mg/cm ²
2774	Positive	Pantry	Room	Baseboard	Wood	A	106	Beige	Intact	1.4 mg/cm ²
2775	Negative	Pantry	Window	Casing	Wood	D	106	Beige	Intact	0.4 mg/cm ²
2776	Negative	Pantry	Window	Apron	Wood	D	106	Beige	Intact	0.1 mg/cm ²
2777	Positive	Pantry	Room	Ceiling	Wood		106	Beige	Intact	16.9 mg/cm ²
2778	Negative	Vestibule	Room	Wall	Drywall	B	101	Gray	Intact	0.1 mg/cm ²
2779	Negative	Vestibule	Room	Wall	Drywall	D	101	Gray	Intact	0.2 mg/cm ²
2780	Negative	Vestibule	Room	Baseboard	Wood	C	101	White	Intact	0.2 mg/cm ²
2781	Negative	Vestibule	Room	Baseboard	Wood	D	101	White	Intact	0.1 mg/cm ²
2782	Negative	Vestibule	Door	Casing	Wood	A	101	White	Intact	0.1 mg/cm ²
2783	Negative	Vestibule	Door	Frame	Wood	A	101	White	Intact	0.2 mg/cm ²
2784	Negative	Vestibule	Room	Ceiling	Plaster		101	White	Intact	0.1 mg/cm ²
2785	Negative	Vestibule	Room	Crown Molding	Wood	C	101	White	Intact	0.2 mg/cm ²
2786	Negative	Office	Room	Wall	Drywall	A	104	Green	Intact	0.1 mg/cm ²
2787	Negative	Office	Room	Wall	Drywall	C	104	Green	Intact	0.8 mg/cm ²
2788	Negative	Office	Room	Wall	Wood	C	104	White	Intact	0.1 mg/cm ²
2789	Negative	Office	Room	Baseboard	Wood	B	102	White	Intact	0.1 mg/cm ²
2790	Negative	Office	Room	Baseboard	Wood	D	102	White	Intact	0.1 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
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 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2791	Negative	Office	Window	Casing	Wood	A	102	White	Intact	0.0 mg/cm ²
2792	Negative	Office	Window	Sill	Wood	A	102	White	Intact	0.2 mg/cm ²
2793	Negative	Office	Door	Casing	Wood	B	102	White	Intact	0.1 mg/cm ²
2794	Negative	Office	Door	Jamb	Wood	B	102	White	Intact	0.1 mg/cm ²
2795	Negative	Office	Door	Buck	Wood	B	102	White	Intact	0.2 mg/cm ²
2796	Negative	Office	Room	Ceiling	Drywall		102	White	Intact	0.2 mg/cm ²
2797	Negative	Office	Room	Crown Molding	Wood		102	White	Intact	0.2 mg/cm ²
2798	Negative	Office	Room	Wall	Drywall	A	108	Green	Intact	0.2 mg/cm ²
2799	Negative	Office	Room	Wall	Drywall	C	108	Green	Intact	0.2 mg/cm ²
2800	Negative	Office	Room	Baseboard	Wood	D	108	White	Intact	0.1 mg/cm ²
2801	Negative	Office	Room	Baseboard	Wood	C	108	White	Intact	0.2 mg/cm ²
2802	Negative	Office	Door	Casing	Wood	D	108	White	Intact	0.1 mg/cm ²
2803	Negative	Office	Door	Jamb	Wood	D	108	White	Intact	0.1 mg/cm ²
2804	Negative	Office	Window	Sill	Wood	A	108	White	Intact	0.2 mg/cm ²
2805	Negative	Office	Window	Casing	Wood	A	108	White	Intact	0.2 mg/cm ²
2806	Negative	Office	Room	Ceiling	Plaster		108	White	Intact	0.2 mg/cm ²
2807	Negative	Office	Room	Crown Molding	Wood		108	White	Intact	0.0 mg/cm ²
2808	Negative	Conference	Room	Wall	Drywall	C	109	Green	Intact	0.2 mg/cm ²
2809	Positive	Conference	Room	Wall	Drywall	B	109	Green	Intact	14.8 mg/cm ²
2810	Positive	Conference	Room	Wall	Drywall	B	109	Green	Intact	13.6 mg/cm ²
2811	Positive	Conference	Room	Wall	Drywall	D	109	Green	Intact	15.0 mg/cm ²
2812	Negative	Conference	Room	Baseboard	Wood	C	109	White	Intact	0.1 mg/cm ²
2813	Negative	Basement Mechanical	Room	Wall	Concrete	A	003	White	Deteriorated	0.2 mg/cm ²
2814	Negative	Basement Mechanical	Room	Wall	Concrete	C	003	White	Deteriorated	0.5 mg/cm ²
2815	Negative	Basement Mechanical	Room	Wall	Concrete	D	003	White	Deteriorated	0.7 mg/cm ²
2816	Negative	Basement Mechanical	Room	Wall	Brick		003	White	Deteriorated	0.6 mg/cm ²

Girls Inc

Inspection Date: 1/31/2024 - 2/8/2024
 Action Level: 1.0 (mg/cm²)
 Total Readings: 481
 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2817	Negative	Basement Mechanical	Room	Wall	Brick		003	White	Deteriorated	0.2 mg/cm ²
2818	Negative	Basement Mechanical	Room	Ceiling	Drywall		003	Tan	Deteriorated	0.3 mg/cm ²
2819	Negative	Basement	Room	Wall	Concrete		001	White	Deteriorated	0.6 mg/cm ²
2820	Negative	Basement	Room	Wall	Concrete		001	White	Deteriorated	0.5 mg/cm ²
2821	Negative	Basement	Room	Wall	Brick		001	White	Deteriorated	0.6 mg/cm ²
2822	Negative	Basement	Room	Wall	Brick		001	White	Deteriorated	0.5 mg/cm ²
2823	Negative	Basement	Room	Ceiling	Wood		001	White	Deteriorated	0.2 mg/cm ²
2824	Negative	Basement	Room	Ceiling	Metal		001	White	Deteriorated	0.2 mg/cm ²
2825	Negative	Storage	Room	Ceiling	Wood		002	White	Deteriorated	0.1 mg/cm ²
2826	Negative	Storage	Room	Wall	Brick		002	White	Deteriorated	0.5 mg/cm ²
2827	Negative	Storage	Room	Wall	Concrete		002	White	Deteriorated	0.2 mg/cm ²
2828	Negative	Storage	Room	Ceiling	Metal		002	White	Deteriorated	0.2 mg/cm ²
2829	Positive	Storage	Room	Ceiling	Metal		002	White	Deteriorated	11.6 mg/cm ²
2830	Negative	Storage	Pipe	Horizontal	Metal		002	White	Deteriorated	0.3 mg/cm ²
2831	Negative	Storage	Pipe	Horizontal	Metal		002	White	Deteriorated	0.2 mg/cm ²
2832	Positive	Storage	Pipe	Horizontal	Metal		002	White	Deteriorated	11.0 mg/cm ²
2833	Negative	Electrical	Room	Ceiling	Plaster		004	White	Deteriorated	0.2 mg/cm ²
2834	Positive	Electrical	Pipe	Horizontal	Metal		004	White	Deteriorated	6.1 mg/cm ²
2835	Negative	Electrical	Room	Ceiling	Wood		004	White	Deteriorated	0.1 mg/cm ²
2836	Negative	Electrical	Room	Wall	Brick		004	White	Deteriorated	0.3 mg/cm ²
2837	Negative	Electrical	Room	Wall	Concrete		004	White	Deteriorated	0.5 mg/cm ²
2838	Negative	Electrical	Pipe	Vertical	Metal		004	Brown	Deteriorated	0.5 mg/cm ²
2839	Negative	Electrical	Pipe	Vertical	Metal		004	White	Deteriorated	0.3 mg/cm ²
2840	Negative	Electrical	Pipe	Vertical	Metal		004	White	Deteriorated	0.2 mg/cm ²
2841	Negative	Electrical	Stair	Riser	Wood		004	Blue	Deteriorated	0.6 mg/cm ²
2842	Negative	Electrical	Stair	Railing	Metal		004	Black	Deteriorated	0.9 mg/cm ²

Girls Inc

Inspection Site: 130 Lincoln Street, Meriden, CT

Inspection Date: 1/31/2024 - 2/8/2024

Action Level: 1.0 (mg/cm²)

Total Readings: 481

Unit Started: 01/31/2024 10:54:25

Unit Ended: 02/08/2024 14:40:07

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
2843	(CAL)									1.2 mg/cm ²
2844	(CAL)									0.9 mg/cm ²
2845	(CAL)									1.1 mg/cm ²
3064	(CAL)									1.1 mg/cm ²
3065	(CAL)									1.2 mg/cm ²
3066	(CAL)									1.2 mg/cm ²
3067	Negative	Building	Stair	Risers	Wood	A	307	Blue	Intact	0.1 mg/cm ²
3068	Negative	Building	Stair	Railing	Wood	A	307	Blue	Intact	0.2 mg/cm ²
3069	Negative	Building	Stair	Treads	Wood	A	307	Blue	Deteriorated	0.0 mg/cm ²
3070	Negative	Building	Stair	Risers	Wood	A	307	Blue	Deteriorated	0.1 mg/cm ²
3071	Negative	Porch	Porch	Floor	Wood	A	307	Blue	Deteriorated	0.2 mg/cm ²
3072	Negative	Porch	Porch	Railing	Wood	A	307	Blue	Deteriorated	0.2 mg/cm ²
3073	Negative	Building	Porch	Wall	siding	A	307	White	Deteriorated	0.1 mg/cm ²
3074	Negative	Building	Door	Casing	Wood	A	307	Black	Intact	0.2 mg/cm ²
3075	Negative	Building	Door	Frame	Wood	A	307	White	Intact	0.2 mg/cm ²
3076	Negative	Building	Door	Jamb	Wood	A	307	White	Intact	0.1 mg/cm ²
3077	Negative	Building	Door	Threshold	Wood	A	307	Brown	Intact	0.2 mg/cm ²
3078	Negative	Building	Wall	siding	siding	A	307	White	Deteriorated	0.2 mg/cm ²
3079	Negative	Building	Foundation	foundation	Concrete	A	307	Brown	Intact	0.3 mg/cm ²
3080	Negative	Building	Window	Sill	Vinyl	A	307	White	Intact	0.0 mg/cm ²
3081	Negative	Building	Window	Exterior Sash	Vinyl	A	307	White	Intact	0.1 mg/cm ²
3082	Negative	Building	Window	Exterior Casing	Vinyl	A	307	White	Intact	0.1 mg/cm ²
3083	Negative	Building	Window	exterior well	Wood	A	307	Red	Deteriorated	0.1 mg/cm ²
3084	Positive	Building	Window	exterior casing	Vinyl	A	307	Tan	Intact	19.5 mg/cm ²

Girls Inc

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Inspection Site: 130 Licoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3085	Positive	Building	Window	exterior header	Vinyl	A	307	Tan	Intact	17.1 mg/cm ²
3086	Positive	Building	Window	exterior casing	Vinyl	A	307	Tan	Intact	7.2 mg/cm ²
3087	Positive	Building	Window	Exterior Sill	Vinyl	A	307	White	Intact	2.2 mg/cm ²
3088	Positive	Building	Window	Casing	Vinyl	A	307	White	Intact	4.0 mg/cm ²
3089	Negative	Building	Window	Exterior Sash	Vinyl	A	307	White	Intact	0.3 mg/cm ²
3090	Negative	Building	Foundation	foundation	Concrete	A	307	Red	Intact	0.3 mg/cm ²
3091	Negative	Building	Porch	Railing	Metal	A	307	Black	Deteriorated	0.0 mg/cm ²
3092	Negative	Building	Door	Frame	Vinyl	A	307	White	Intact	0.2 mg/cm ²
3093	Negative	Building	Door	Casing	Wood	A	307	White	Deteriorated	0.1 mg/cm ²
3094	Negative	Building	Door	Jamb	Wood	A	307	White	Deteriorated	0.2 mg/cm ²
3095	Negative	Building	Window	Sill	Vinyl	A	307	White	Intact	0.3 mg/cm ²
3096	Negative	Building	Window	Exterior Sash	Vinyl	A	307	White	Intact	0.0 mg/cm ²
3097	Negative	Building	Wall	Siding	vinyl siding	A	307	White	Intact	0.2 mg/cm ²
3098	Negative	Building	Window	Exterior Sill	Vinyl	A	307	White	Intact	0.1 mg/cm ²
3099	Negative	Building	Window	Exterior Casing	Vinyl	A	307	White	Intact	0.4 mg/cm ²
3100	Negative	Building	Window	Exterior Sash	Vinyl	A	307	White	Intact	0.2 mg/cm ²
3101	Negative	Building	Wall	Exterior Wall	Brick	A	307	Red	Intact	0.3 mg/cm ²
3102	Positive	Building	Wall	Vinyl Siding	vinyl siding	A	308	White	Intact	7.2 mg/cm ²
3103	Positive	Building	Wall	Vinyl Siding	vinyl siding	A	308	White	Intact	7.8 mg/cm ²
3104	Negative	Building	Foundation	Foundation	Concrete	A	308	Red	Intact	0.1 mg/cm ²
3105	Negative	Building	Door	Frame	Vinyl	A	308	White	Intact	0.1 mg/cm ²
3106	Positive	Building	Door	Casing	Wood	A	308	Blue	Deteriorated	3.9 mg/cm ²
3107	Negative	Building	Door	Jamb	Wood	A	308	Brown	Intact	0.5 mg/cm ²
3108	Positive	Building	Porch	Column	Wood	A	308	White	Deteriorated	37 mg/cm ²
3109	Positive	Building	Window	Sill	Vinyl	A	308	White	Intact	3.8 mg/cm ²
3110	Positive	Building	Window	Exterior Casing	Vinyl	A	308	White	Intact	9.5 mg/cm ²

Girls Inc

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Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3111	Negative	Building	Window	Exterior Sash	Vinyl		308	White	Intact	0.3 mg/cm ²
3112	Positive	Building	Wall	Vinyl Siding	vinyl siding		309	White	Intact	6.8 mg/cm ²
3113	Positive	Building	Wall	Vinyl Siding	vinyl siding		309	White	Intact	8.3 mg/cm ²
3114	Negative	Building	Foundation	Foundation	Concrete		309	White	Intact	0.3 mg/cm ²
3115	Positive	Building	Foundation	Foundation	Concrete		309	Red	Intact	8.9 mg/cm ²
3116	Negative	Building	Foundation	Foundation	Concrete		309	Red	Intact	0.7 mg/cm ²
3117	Negative	Building	Foundation	Foundation	Concrete		309	Red	Intact	0.9 mg/cm ²
3118	Positive	Building	Window	Exterior Sill	Vinyl		309	White	Intact	2.0 mg/cm ²
3119	Positive	Building	Window	Exterior Casing	Vinyl		309	White	Intact	22.3 mg/cm ²
3120	Negative	Building	Window	Exterior Sash	Vinyl		309	White	Intact	0.3 mg/cm ²
3121	Negative	Building	Porch	Floor	Wood		309	White	Deteriorated	0.3 mg/cm ²
3122	Positive	Building	Porch	Column	Wood		309	White	Deteriorated	36 mg/cm ²
3123	Positive	Building	Door	Frame	Wood		309	Red	Intact	19.0 mg/cm ²
3124	Positive	Building	Door	Jamb	Wood		309	White	Intact	10.2 mg/cm ²
3125	Negative	Building	Door	Threshold	Wood		309	Blue	Intact	0.3 mg/cm ²
3126	Negative	Building	Door	Frame	Metal		309	Red	Intact	0.0 mg/cm ²
3127	Negative	Building	Door	Outer Casing	Metal		309	White	Intact	0.5 mg/cm ²
3128	Negative	Building	Door	Jamb	Metal		309	White	Intact	0.5 mg/cm ²
3129	Negative	Building	Window	Sill	Metal		309	Black	Intact	0.3 mg/cm ²
3130	Negative	Building	Window	Casing	Metal		309	Black	Intact	0.3 mg/cm ²
3131	Negative	Building	Window	Jamb	Metal		309	Black	Intact	0.4 mg/cm ²
3132	Negative	Building	Door	Frame	Metal		309	Red	Intact	0.1 mg/cm ²
3133	Negative	Building	Exterior Wall	Exterior Wall	Brick		309	Red	Intact	0.3 mg/cm ²
3134	Negative	Building	Exterior Wall	Exterior Wall	Brick		310	Red	Intact	0.1 mg/cm ²
3135	Negative	Building	Window	Sill	Metal		310	Black	Intact	0.2 mg/cm ²
3136	Negative	Building	Window	Casing	Metal		310	Black	Intact	0.2 mg/cm ²

Girls Inc

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 Unit Started: 01/31/2024 10:54:25
 Unit Ended: 02/08/2024 14:40:07

Inspection Site: 130 Licoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3137	Negative	Building	Window	Sash	Metal		310	Black	Intact	0.1 mg/cm ²
3138	Negative	Building	Door	Frame	Metal		310	Tan	Intact	0.2 mg/cm ²
3139	Negative	Building	Foundation		Concrete		310	Brown	Intact	0.2 mg/cm ²
3140	Negative	Building	Porch	Crown Molding	Wood		307	White	Intact	0.2 mg/cm ²
3141	Positive	Building	Porch	Ceiling	Vinyl		308	White	Intact	9.9 mg/cm ²
3142	Positive	Building	Porch	Ceiling	Wood		309	Blue	Intact	3.7 mg/cm ²
3143	Positive	Building	Porch	Railing	Wood		309	White	Intact	1.1 mg/cm ²
3144	Positive	Building	Room	Wall	Plaster	B	107	Gray	Intact	5.5 mg/cm ²
3145	Positive	Building	Room	Baseboard	Wood	B	107	White	Intact	9.1 mg/cm ²
3146	Positive	Building	Room	Baseboard	Wood	D	107	White	Intact	8.9 mg/cm ²
3147	Positive	Building	Room	Wall	Plaster	D	107	Gray	Intact	10.6 mg/cm ²
3148	Positive	Building	Door	Casing	Wood	C	107	White	Intact	21.9 mg/cm ²
3149	Positive	Building	Door	Frame	Wood	C	107	White	Intact	19.4 mg/cm ²
3150	Positive	Building	Door	Jamb	Wood	C	107	White	Intact	35 mg/cm ²
3151	Negative	Building	Door	Threshold	Wood	C	107	Blue	Intact	0.3 mg/cm ²
3152	Positive	Building	Door	Casing	Wood	B	107	White	Intact	18.3 mg/cm ²
3153	Positive	Building	Door	Jamb	Wood	B	107	White	Intact	9.6 mg/cm ²
3154	Negative	Building	Door	Frame	Wood	B	107	White	Intact	0.2 mg/cm ²
3155	Negative	Building	Room	Wall	Drywall	A	110	Green	Intact	0.2 mg/cm ²
3156	Negative	Building	Room	Wall	Drywall	C	110	Green	Intact	0.7 mg/cm ²
3157	Positive	Building	Room	Wall	Drywall	B	110	Green	Intact	17.8 mg/cm ²
3158	Positive	Building	Room	Wall	Drywall	D	110	Green	Intact	9.9 mg/cm ²
3159	Negative	Building	Room	Baseboard	Wood	D	110	White	Intact	0.4 mg/cm ²
3160	Positive	Building	Room	Baseboard	Wood	B	110	White	Intact	10.6 mg/cm ²
3161	Positive	Building	Door	Casing	Wood	B	110	White	Intact	32 mg/cm ²
3162	Positive	Building	Door	Jamb	Wood	B	110	White	Intact	4.1 mg/cm ²

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Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3163	Positive	Building	Fire Place	Mantle	Wood	C	110	White	Intact	12.7 mg/cm ²
3164	Positive	Building	Fire Place	Frame	Wood	C	110	White	Intact	4.5 mg/cm ²
3165	Negative	Building	Room	Ceiling	Plaster		110	White	Intact	0.2 mg/cm ²
3166	Positive	Building	Room	Wall	Plaster	A	112	Purple	Intact	6.5 mg/cm ²
3167	Positive	Building	Room	Wall	Plaster	C	112	Purple	Intact	5.6 mg/cm ²
3168	Negative	Building	Room	Wall	Plaster	B	112	Purple	Intact	0.2 mg/cm ²
3169	Positive	Building	Room	Wall	Plaster	D	112	Purple	Intact	6.0 mg/cm ²
3170	Positive	Building	Door	Jamb	Wood	D	112	White	Intact	14.0 mg/cm ²
3171	Positive	Building	Door	Casing	Wood	D	112	White	Intact	24.5 mg/cm ²
3172	Positive	Building	Door	Frame	Wood	D	112	White	Intact	21.7 mg/cm ²
3173	Negative	Building	Door	Frame	Wood	C	112	Blue	Intact	0.1 mg/cm ²
3174	Negative	Building	Door	Jamb	Wood	C	112	Blue	Intact	0.2 mg/cm ²
3175	Negative	Building	Door	Casing	Wood	C	112	Blue	Intact	0.1 mg/cm ²
3176	Negative	Building	Room	Baseboard	Wood	C	112	White	Intact	0.0 mg/cm ²
3177	Positive	Building	Room	Wall	Plaster	A	111	Purple	Intact	3.2 mg/cm ²
3178	Positive	Building	Room	Wall	Plaster	C	111	Purple	Intact	6.0 mg/cm ²
3179	Positive	Building	Room	Wall	Plaster	B	111	Purple	Intact	4.4 mg/cm ²
3180	Negative	Building	Room	Wall	Plaster	D	111	Purple	Intact	0.4 mg/cm ²
3181	Positive	Building	Room	Baseboard	Wood	A	111	White	Intact	11.6 mg/cm ²
3182	Positive	Building	Pipe	Vertical	Metal	A	111	White	Intact	7.8 mg/cm ²
3183	Positive	Building	Fire Place	Mantle	Wood	A	111	White	Intact	12.6 mg/cm ²
3184	Positive	Building	Fire Place	Frame	Wood	A	111	White	Intact	11.8 mg/cm ²
3185	Positive	Building	Door	Frame	Wood	A	111	White	Intact	11.0 mg/cm ²
3186	Positive	Building	Door	Casing	Wood	A	111	White	Intact	14.9 mg/cm ²
3187	Positive	Building	Door	Jamb	Wood	A	111	White	Intact	17.5 mg/cm ²
3188	Positive	Building	Window	Casing	Wood	C	111	White	Intact	11.4 mg/cm ²

Girls Inc

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Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3189	Positive	Building	Window	Sill	Wood	C	111	White	Intact	1.9 mg/cm ²
3190	Negative	Building	Window	Stop	Wood	C	111	White	Intact	0.6 mg/cm ²
3191	Positive	Building	Window	Jamb	Wood	C	111	White	Intact	1.4 mg/cm ²
3192	Negative	Building	Room	Ceiling	Plaster		111	White	Intact	0.7 mg/cm ²
3193	Negative	Building	Room	Wall	Ceramic	A	113	Pink	Intact	0.9 mg/cm ²
3194	Positive	Building	Window	Casing	Wood	C	113	Blue	Intact	31 mg/cm ²
3195	Positive	Building	Window	Well	Wood	C	113	Blue	Intact	32 mg/cm ²
3196	Positive	Building	Window	Jamb	Wood	C	113	Blue	Intact	8.0 mg/cm ²
3197	Negative	Building	Room	Floor	Ceramic		113	Pink	Intact	0.1 mg/cm ²
3198	Negative	Building	Room	Ceiling	Plaster		113	White	Intact	0.9 mg/cm ²
3199	Negative	Building	Room	Wall	Concrete	B	114	Blue	Intact	0.2 mg/cm ²
3200	Negative	Building	Room	Wall	Concrete	D	114	Blue	Intact	0.1 mg/cm ²
3201	Negative	Building	Pipe	Vertical	Concrete	D	114	Blue	Intact	0.1 mg/cm ²
3202	Negative	Building	Room	Floor	Concrete	D	114	Gray	Deteriorated	0.3 mg/cm ²
3203	Negative	Building	Room	Wall	Drywall	A	114	Blue	Intact	0.3 mg/cm ²
3204	Negative	Building	Radiator	Wall	Metal	B	114	Blue	Intact	0.1 mg/cm ²
3205	Negative	Building	Window	Sill	Metal	B	114	Black	Intact	0.3 mg/cm ²
3206	Negative	Building	Window	Jamb	Metal	B	114	Black	Intact	0.1 mg/cm ²
3207	Negative	Building	Room	Ceiling	Plaster		114	White	Intact	0.1 mg/cm ²
3208	Negative	Building	Room	Wall	Concrete	B	112	White	Intact	0.3 mg/cm ²
3209	Negative	Building	Room	Wall	Concrete	D	112	White	Intact	0.3 mg/cm ²
3210	Negative	Building	Room	Baseboard	Vinyl	D	112	Black	Intact	0.2 mg/cm ²
3211	Negative	Building	Window	Sill	Metal	D	112	Black	Intact	0.2 mg/cm ²
3212	Negative	Building	Window	Casing	Metal	D	112	Black	Intact	0.2 mg/cm ²
3213	Negative	Building	Window	Stop	Metal	D	112	Black	Intact	0.1 mg/cm ²
3214	Negative	Building	Door	Frame	Wood	D	112	White	Intact	0.2 mg/cm ²

Girls Inc

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Inspection Site: 130 Lincoln Street, Meriden, CT

Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3215	Negative	Building	Door	Jamb	Wood	D	112	White	Intact	0.1 mg/cm ²
3216	Negative	Building	Room	Wall	Concrete	A	121	White	Intact	0.3 mg/cm ²
3217	Negative	Building	Room	Wall	Concrete	D	121	White	Intact	0.3 mg/cm ²
3218	Negative	Building	Window	Sill	Metal	B	121	Black	Intact	0.1 mg/cm ²
3219	Negative	Building	Window	Jamb	Metal	B	121	Black	Intact	0.1 mg/cm ²
3220	Negative	Building	Room	Wall	Plaster	A	120	Yellow	Intact	0.3 mg/cm ²
3221	Negative	Building	Room	Wall	Plaster	C	120	Yellow	Intact	0.3 mg/cm ²
3222	Negative	Building	Radiator		Metal	A	120	Yellow	Intact	0.1 mg/cm ²
3223	Negative	Building	Room	Baseboard	Vinyl	A	120	Blue	Intact	0.3 mg/cm ²
3224	Negative	Building	Vent		Metal		120	Yellow	Intact	0.0 mg/cm ²
3225	Positive	Building	Window	Sill	Wood	A	120	White	Intact	6.9 mg/cm ²
3226	Negative	Building	Window	Jamb	Wood	A	120	White	Intact	0.3 mg/cm ²
3227	Negative	Building	Window	Sash	Wood	A	120	White	Intact	0.2 mg/cm ²
3228	Negative	Building	Window	Sash	Drywall	C	119	Pink	Intact	0.2 mg/cm ²
3229	Negative	Building	Window	Sash	Drywall	B	119	Pink	Intact	0.3 mg/cm ²
3230	Negative	Building	Room	Wall	Drywall	B	119	Pink	Intact	0.2 mg/cm ²
3231	Negative	Building	Room	Wall	Drywall	C	119	Pink	Intact	0.2 mg/cm ²
3232	Negative	Building	Room	Baseboard	Wood	A	119	White	Intact	0.2 mg/cm ²
3233	Positive	Building	Room	Floor	Ceramic	A	119	Blue	Intact	1.6 mg/cm ²
3234	Positive	Building	Room	Floor	Ceramic	A	119	Blue	Intact	1.5 mg/cm ²
3235	Negative	Building	Radiator		Metal	D	119	White	Intact	0.1 mg/cm ²
3236	Negative	Building	A/C		Metal		115	Tan	Intact	0.7 mg/cm ²
3237	Negative	Building	Room	Wall	Plaster	D	115	Blue	Intact	0.8 mg/cm ²
3238	Positive	Building	Room	Wall	Plaster	C	115	Blue	Intact	1.1 mg/cm ²
3239	Negative	Building	Room	Ceiling	Wood		115	Brown	Intact	0.1 mg/cm ²
3240	Positive	Building	Window	Sill	Wood	C	115	Blue	Intact	5.4 mg/cm ²

Girls Inc

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Read #	Result	-->RoomChoice	Structure	-->Member	Substrate	Wall	Room ID	Color	Condition	Lead (mg/cm ²)
3241	Negative	Building	Window	Jamb	Wood	C	115	Blue	Intact	0.8 mg/cm ²
3242	Positive	Building	Door	Frame	Metal	B	115	Brown	Intact	6.0 mg/cm ²
3243	Positive	Building	Door	Jamb	Metal	B	115	White	Intact	6.4 mg/cm ²
3244	Positive	Building	Door	Jamb	Metal	B	115	Blue	Intact	4.8 mg/cm ²
3245	Negative	Building	Room	Wall	Drywall	A	116	Gray	Intact	0.1 mg/cm ²
3246	Negative	Building	Window	Casing	Wood	A	116	White	Intact	0.1 mg/cm ²
3247	Negative	Building	Window	Jamb	Wood	A	116	White	Intact	0.2 mg/cm ²
3248	Negative	Building	Room	Baseboard	Wood	A	116	White	Intact	0.0 mg/cm ²
3249	Negative	Building	Window	Jamb	Wood	A	116	Brown	Intact	0.5 mg/cm ²
3250	Negative	Building	Window	Jamb	Wood	A	206	Brown	Intact	0.5 mg/cm ²
3251	Negative	Building	Window	Jamb	Wood	A	203	Brown	Intact	0.6 mg/cm ²
3252	Negative	Building	Window	Jamb	Wood	A	210	Brown	Intact	0.4 mg/cm ²
3253	Negative	Building	Window	Jamb	Wood	A	206	Brown	Intact	0.5 mg/cm ²
3254	(CAL)									0.9 mg/cm ²
3255	(CAL)									1.0 mg/cm ²
3256	(CAL)									0.8 mg/cm ²

----- END OF READINGS -----

SECTION 03 3000 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following
 1. Cast-in-place concrete including formwork, reinforcement, concrete materials, mix designs, placement procedures, and finishes.
 2. Implementation of cold weather and hot weather protection measures and all costs related thereto.
- B. Related Sections include the following:
 1. Division 31 Section “Earthwork”

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO): AASHTO M182, Specification for Burlap Cloth Made from Jute or Kenaf.
- B. American Concrete Institute (ACI):
 - ACI 117, Specifications for Tolerances for Concrete Construction and Materials.
 - ACI 301, Specification for Structural Concrete.
 - ACI 302.1R, Guide for Concrete Floor and Slab Construction.
 - ACI 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - ACI 305R, Hot Weather Concreting.
 - ACI 306.1, Specification for Cold Weather Concreting.
 - ACI 318, Building Code Requirements for Structural Concrete.
 - ACI 347R, Guide to Formwork for Concrete.
- C. American Society for Testing and Materials (ASTM):
 - ASTM A82, Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - ASTM A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - ASTM A497, Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

- ASTM A615, Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- ASTM A706, Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
- ASTM A775, Specification for Epoxy-Coated Steel Reinforcing Bars
- ASTMA884, Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
- ASTM C33, Specification for Concrete Aggregates.
- ASTM C39, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- ASTM C42, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- ASTM C94, Specification for Ready-Mixed Concrete.
- ASTM C109, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or Cube Specimens).
- ASTM C150, Specification for Portland Cement.
- ASTM C171, Specification for Sheet Materials for Curing Concrete.
- ASTM C219, Terminology Relating to Hydraulic Cement.
- ASTM C260, Specification for Air-Entraining Admixtures for Concrete.
- ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- ASTM C330, Specification for Lightweight Aggregates for Structural Concrete.
- ASTM C494, Specification for Chemical Admixtures for Concrete.
- ASTM C567, Test Method for Density of Structural Lightweight Concrete.
- ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
- ASTM C881, Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- ASTM C979, Specification for Pigments for Integrally Colored Concrete.
- ASTM C989, Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
- ASTM C1059, Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- ASTM C1077, Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- ASTM C1116, Specification for Fiber-Reinforced Concrete and Shotcrete.
- ASTM C1315, Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
- ASTM D1751, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Type).
- ASTM D1752, Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- ASTM D2240, Test Method for Rubber Property - Durometer Hardness.
- ASTM E96, Test Methods for Water Vapor Transmission of Materials.
- ASTM E154, Test Methods for Water Vapor Retarders used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover.
- ASTM E329, Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- ASTM E548, Guide for General Criteria Used for Evaluating Laboratory Competence.
- ASTM E1643, Practice for Installation of Water Vapor Retarders Used in Contact with Earth and Granular Fill under Concrete Slabs.

ASTM E1745, Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

- D. Concrete Reinforcing Steel Institute (CRSI):
Manual of Standard Practice, current edition.
- E. Corps of Engineers (CE):
CE CRD-C 513, Corps of Engineers Specifications for Rubber Waterstops.
CE CRD-C 572, Corps of Engineers Specifications for Polyvinylchloride Waterstops.

1.4 DEFINITIONS

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

1.5 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: Submit separate concrete mix designs for each strength class of normal weight and lightweight concrete and for pumped concrete.
- C. Reinforcing Steel Shop Drawings: Reinforcement shop drawings showing fabrication, bending, and placement of steel reinforcing bars. Indicate reference to elevations, column and wall grid lines, and other pertinent details of the contract documents. Wall reinforcement shall be shown on wall elevations drawn to scale. Fabrication shall not commence prior to receipt of engineer's comments on reviewed drawings.
- D. Formwork Shop Drawings: Prepared by or under supervision of a qualified professional engineer, licensed in the State of Connecticut, detailing fabrication, assembly and support for formwork. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.
- E. Samples: Submit for waterstops, vapor retarder, vapor barrier.
- F. Certificates: Manufacturer's certification that the materials governed by this Section including cement, grout, admixtures, reinforcing steel and accessories shall meet the requirements of this specification.
- G. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- H. Submit cold weather protection plan no less than fourteen (14) days prior to commencement of concrete work.
- I. Submit hot weather protection plan no less than fourteen (14) days prior to commencement of concrete work.
- J. Submit minimum 1/8" scale dimensioned plans showing proposed contraction joint

locations for concrete slabs-on-grade per Section 03 3000, 3.7, D.

1.6 QUALITY ASSURANCE

- A. The work of this Section shall conform to the 2018 CT State Building Code, which shall include the 2015 International Building Code and 2018 Connecticut Amendment.
- B. The standards of the American Society for Testing and Material and the American Concrete Institute, referred to in these specifications by their serial designation and declared to be a part of these specifications, the same as if fully set forth herein.
- C. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C94 requirements for production facilities and equipment.
- D. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from same manufacturer's plant, obtain aggregate from one (1) source, and obtain admixtures through one (1) source from a single manufacturer.
- E. The work of this Section shall conform to all requirements of ACI 301, "Specifications for Structural Concrete for Buildings". Although this Section states in condensed form, the pertinent provisions of that document, it shall be understood that it has been adopted in its entirety and may be referred to throughout the project for provisions not restated below.
- F. Concrete floor and slab construction shall conform to the recommendations of ACI 302.IR, "Guide for Concrete Floor and Slab Construction".
- G. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. **Pre-installation Conference:** Conduct conference at Project site.

1.7 DELIVERY, STORAGE AND HANDLING

- A. **Steel Reinforcement:** Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. **Smooth-Formed Finished Concrete:** Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Plywood, metal, or other approved panel materials.
- B. **Rough-Formed Finished Concrete:** Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two (2) edges and one (1) side for tight fit.

- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- E. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- F. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- G. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
Formulate form-release agent with rust inhibitor for steel form-facing materials.
- H. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
Furnish units that will leave no corrodible metal closer than one (1) inch to the plane of exposed concrete surface.
Furnish ties that, when removed, will leave holes no larger than one (1) inch in diameter in concrete surface.
Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed.
- B. Plain-Steel Wire: ASTM A82, as drawn.
- C. Plain-Steel Welded Wire Fabric: ASTM A185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spaces, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

For concrete surfaces exposed to view where legs of wire bar supports contact forms,

use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless steel bar supports.

2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I or Type II with the following supplementary materials.
- B. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
- C. Normal-Weight Aggregate: ASTM C33, uniformly graded from a single source, not exceeding 1-1/2-inch nominal size. Refer to ACI Standard for other limitations on aggregate size.
- D. Water: Complying with ASTM C94.

2.5 ADMIXTURES

- A. General: The maximum water-soluble chloride ion concentrations in hardened concrete contributed from all sources including water, aggregates, cementitious materials, and admixtures shall not exceed the following limits:
0.15 percent (0.0015) for reinforced concrete exposed to moisture in service.
1.0 percent (0.01) for reinforced concrete not exposed to moisture in service.
- B. Air-Entraining Admixture: ASTM C260.
- C. Water-Reducing Admixture: ASTM C494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C494, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
- G. Concrete moisture vapor reduction admixture for all interior suspended slab and slab on grade construction shall be Barrier One, Inc., 522 S. Hunt Club Blvd., #303, Apopka Florida 32703. Contact Manufacturer's representative: 877.224.5850, Fax: 866.594.3490. Concrete mix design shall contain 14 oz. of Barrier-1 admixture per 100 pounds of cementitious material or as otherwise recommended by manufacturer.

2.6 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and direction changes.

Manufacturers:

- a. Greenstreak.
- b. W. R. Meadows, Inc.

Profile and Dimensions: As indicated on drawings.

2.7 VAPOR BARRIER

- A. Plastic Vapor Barrier: A flexible, preformed sheet membrane having a water-vapor permeance rate no greater than 0.012 perms when tested in accordance with ASTM E154, Section 7 and ASTM E96, and otherwise conforming to ASTM E1745, Class B or higher. Vapor barrier shall be no less than 10 mils thick in accordance with ACI 302.1R.

Manufacturers:

- a. Stego Industries LLC; Stego Wrap, 15-mils.
- b. W.R. Meadows, Inc.; Premoulded membrane with PLASMATIC CORE.
- c. Alumiseal; Zero-Perm.

2.8 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.

Products:

- a. Dayton Superior Corporation; Day-Chem Sure Hard.
- b. L&M Construction Chemicals, Inc.; Seal Hard.
- c. Nox-Crete Products Group, Kinsman Corporation; Duranox.

2.9 CURING MATERIALS

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

Products:

- a. Euclid Chemical Company (The); Eucobar.
- b. Lambert Corporation; Lambco Skin.
- c. W.R. Meadows, Inc.; Sealtight Evapre.

- B. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf.

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

- D. Water: Potable.

- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, non-dissipating.

Products:

- a. Anti-Hydro International, Inc.; AH Clear Cure WB.
- b. Euclid Chemical Company (The); Aqua Cure VOX.

c. W.R. Meadows, Inc.; Vocomp-20.

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

Products:

- a. Euclid Chemical Company (The); Super Diamond Clear.
- b. W.R. Meadows, Inc.; CS-309/30.
- c. Sonneborn, Div. of ChemRex; Kure-N-Seal 5.

2.10 RELATED MATERIALS

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

B. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

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

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

D. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336-inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.11 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Slump Adjustment

Adding water to concrete mix in transit or at the construction site will not be permitted without prior approval of the Engineer. Increased slump for pumped concrete shall be made with admixtures (not water) in conformance with approved design mix.

C. Special Requirements for Concrete Durability

Concrete that will be subject to the following exposures in service shall conform to the corresponding water-cementitious materials ratio and minimum specified concrete compressive strength at 28 days.

- a. Concrete exposed to freezing and thawing in a moist condition or to deicing chemicals – maximum water-cementitious materials ratio = 0.50 and minimum compressive strength = 4,000 psi at 28 days.
- b. Concrete intended to have low permeability when exposed to water - maximum water-cementitious materials ratio = 0.50 and minimum compressive strength = 4,000 psi at 28 days.

- D. Prepare design mixes, proportioned according to ACI 301, for concrete determined by either laboratory trial mix or field test data bases, as follows:
Compressive Strength (28 Days): 4,000 psi normal weight for all slabs on grade.
Compressive Strength (28 Days): 3,000 psi normal weight for all footings and walls.

Slump:

- a. Four (4) inches for slabs.
 - b. Five (5) inches for all other concrete.
 - c. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than eight (8) inches after adding admixture to plant- or site-verified, 2 to 3 inch slump.
- E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0 percent within a tolerance of plus 1.0 or minus 1.5 percent. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent. All other interior and exterior concrete shall have the aforementioned air content percent.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement in accordance with CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C94.
When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes. When air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.
- B. Provide batch ticket for each batch discharged and used in the Work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, construct, erect, shore, brace, and maintain formwork according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

Class A, 1/8-inch for smooth-formed finished surfaces.
Class B, 1/4-inch for rough-formed finished surfaces.
Class C, 1/2-inch for concealed concrete.

- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area or formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- M. All forms used in exposed finish shall be new.

3.2 EMBEDDED ITEMS

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

3.3 REMOVING AND REUSING FORMS

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

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete.

3.5 VAPOR BARRIERS

- A. Vapor Barrier: Install, protect, and repair vapor-barrier sheets according to ASTM E1643; place sheets in position with longest dimension parallel with direction of pour.
 - 1. Lap joints six (6) inches and seal with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing plus two (2) inches. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

- A. Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Locate and install so as not to impair strength or appearance of

concrete, at locations indicated or as approved by Architect.

- C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
- D. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints along column centerlines and at a maximum spacing of 20'-0" on center in both directions. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one (1) side of joint.

3.8 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: If permitted, install in construction joints and at other joints indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- C. Do not add water to concrete during delivery, at project site, or during placement.
- D. Consolidate concrete with mechanical vibrating equipment.

3.10 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with

tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4-inch in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.

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

2. Apply smooth-rubbed, grout-cleaned, or cork-floated finish, defined in ACI 301, to smooth-formed finished concrete as indicated or directed.

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

D. Permanently Exposed Formed Surfaces: Remove fins and other projections exceeding 1/8" in thickness, repair and patch form tie holes and other defective areas. Apply mixture of tinted Portland cement and fine aggregate per 3.16B, and as directed by Architect.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, Portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.

D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

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

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
 2. Finish surfaces to the following tolerances, measured within 24 hours according To ASTM E 1155/E 1155M for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs on grade.
 - b. Specified overall values of flatness, F(F) 30; and levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and levelness, F(L) 15; for suspended slabs.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- G. Non-slip Broom Finish: Apply a non-slip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as indicated on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.13 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven (7) days as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist with continuous water-fog spray or absorptive cover, water saturated and kept continuously wet.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. Apply at permanently exposed concrete floors only.

3.14 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.15 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact surfaces of joint clean and dry.
- C. Where indicated, install semirigid joint filler full depth in saw-cut joints and at least two (2) inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.
- D. Install semirigid joint filler in all saw cut joints. Overfill joint and trim joint filler flush with top of joint after hardening. Semirigid joint filler shall be Eucolastic I One Part Urethane Sealant as manufactured by Euclid Chemical Co., or approved equal.

3.16 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one (1) part Portland

cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified in this Article are subject to Architect's approval.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement.

END OF SECTION 03 3000

SECTION 05 5213 – PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Galvanized Steel pipe and tube railings.

B. Related Sections:

1. Section 03 3000 "Cast-In-Place Concrete"

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Grout, anchoring cement, and paint products.

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

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Galvanized Steel Pipe and Tube Railings:

1. Provide custom fabricated railings in configuration indicated on contract drawings.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design railings, including attachment to building construction.

- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.

2.3 STEEL AND IRON

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1. Provide galvanized finish for exterior installations and where indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION

- A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- B. Form work true to line and level with accurate angles and surfaces.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- D. Form changes in direction by bending.
- E. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

2.6 STEEL AND IRON FINISHES

- A. Galvanized Railings:
 - 1. Hot-dip galvanize exterior steel railings, after fabrication.
 - 2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
- B. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
 - 1. Do not apply primer to galvanized surfaces.
- E. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

3.2 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 05 5213

SECTION 06 1053 – MISCELLANEOUS 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:
 - 1. Dimensional lumber.
 - 2. Wood Blocking.
 - 3. Structural Panels.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NHLA: National Hardwood Lumber Association.
 - 3. NLGA: National Lumber Grades Authority.
 - 4. SPIB: The Southern Pine Inspection Bureau.
 - 5. WCLIB: West Coast Lumber Inspection Bureau.
 - 6. WWPA: Western Wood Products Association.

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 fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Submittals:

1. Chain-of-custody certificates indicating that products specified to be made from certified wood comply with forest certification requirements. Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.
2. For adhesives, documentation including printed statement of VOC content.
3. For adhesives and plywood, documentation indicating that products 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."

1.5 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Fire-retardant-treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion 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 lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber 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. Certified Wood: Lumber and plywood shall be 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."
- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded 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. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 4. Provide dressed lumber, S4S, unless otherwise indicated.
- C. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- D. Wood Structural Panels:
1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
 2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
 3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
 4. Factory mark panels according to indicated standard.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: All lumber and plywood shall be fire retardant treated. Use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners.
 2. Exterior Type: Treated materials shall comply with requirements specified above for fire- retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

- D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- A. Application: Treat all miscellaneous carpentry and rough carpentry unless otherwise indicated.
 - 1. Dimension lumber wood blocking, equipment support, and similar members.
 - 2. Concealed blocking.
 - 3. Plywood backing panels.

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.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed 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.
- 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.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.
 - 1. Plywood 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."

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Metal Framing: ASTM C 954, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 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 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).
- I. Metal Framing Anchors:
 - 1. Manufacturers: One of the following:
 - a. Simpson Strong Tie Co., Inc
 - b. USP Structural Connectors
 - c. Cleveland Steel Specialty Co.

2. Use anchors made from hot-dip galvanized steel complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. 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.
- D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim. Drawings do not show every piece of blocking.
 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 (406 mm) o.c.
 2. Provide continuous, wall-to-wall plywood blocking at all bathroom walls requiring blocking for such items as grab-bars and other wall-mounted elements. GC to coordinate all blocking so that finished installations shall provide code-required loading and pull-out strength.
 3. Coordinate finished dimensions and framing so that blocking is incorporated behind the finished wall and any required clearances including handicapped clearances. Provide a field layout for review with architect in the field prior to closing walls requiring blocking.
- G. Sort and select lumber so that natural characteristics will 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.
- H. 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.
 2. Use copper naphthenate for items not continuously protected from liquid water.

- I. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. State Building Code.
 - 2. NES NER-272 for power-driven fasteners.
 - 3. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- J. 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.

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 PLYWOOD PANEL INSTALLATION

- A. General: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
 - 1. Comply with "Code Plus" provisions in above-referenced guide.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Sheathing:
 - a. Screw to cold-formed metal framing.
 - b. Space panels 1/8 inch apart at edges and ends.
 - 2. Plywood Backing Panels: Nail or screw to supports.

3.4 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 miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 1053

SECTION 06 2013 - EXTERIOR 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. Exterior primed hardboard and cellular PVC trim.

- B. Related Requirements:

- 1. Section 06 1053 "Miscellaneous Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for framing exposed to view.
- 2. Section 07 2500 "Weather Barriers"
- 3. Section 07 4640 "Vinyl Siding and Soffits"
- 4. Section 09 2900 "Gypsum Board"

1.3 DEFINITIONS

- A. MDO: Plywood with a medium-density overlay on the face.
- B. PVC: Polyvinyl chloride.

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 cellular PVC trim, with half of exposed surface finished; 50 sq. in.

1.5 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Cellular PVC trim.

B. Sample Warranties: For manufacturer's warranties.

1.6 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.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

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 EXTERIOR TRIM

A. Cellular PVC Trim: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for exterior use, made from UV- and heat-stabilized rigid material.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. CPG Building Products LLC.
 - c. Gossen Corporation.

- d. Kleer Lumber, LLC.
 - e. Versatex Trimboard; a Wolfpac Technologies, Inc. company.
 - f. Azek Building Products
2. Density: Not less than 31 lb/cu. ft.
 3. Heat Deflection Temperature: Not less than 130 deg F, according to ASTM D 648.
 4. Coefficient of Thermal Expansion: Not more than 4.5×10^{-5} inches/inch x deg F
 5. Water Absorption: Not more than 1 percent, according to ASTM D 570.
 6. Flame-Spread Index: 75 or less, according to ASTM E 84.

2.2 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.
 1. For face-fastening siding, provide ringed-shank siding nails or hot-dip galvanized-steel siding nails unless otherwise indicated.
 2. For prefinished items, provide matching prefinished aluminum fasteners where face fastening is required.
 3. For pressure-preservative-treated wood, provide stainless steel fasteners.
 4. For applications not otherwise indicated, provide stainless steel fasteners.
- B. Wood Glue: Waterproof resorcinol glue recommended by manufacturer for exterior carpentry use.
- C. Adhesive for Cellular PVC Trim: Product recommended by trim manufacturer.
- D. Flashing: Comply with requirements in Section 07620 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.
 1. Horizontal Joint Flashing for Panel Siding: Preformed, prefinished-aluminum, Z-shaped flashing.
- E. Round Soffit Vents: Stamped aluminum louvered vents, 2-1/2 inches in diameter, made to be inserted in round holes cut in soffit.
 1. Finish: As Selected by the Architect
- F. Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and applicable requirements in Section 07920 "Joint Sealants," and recommended by sealant and substrate manufacturers for intended application.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Franklin International.
 - c. May National Associates, Inc.; a subsidiary of Sika Corporation.
 - d. Pecora Corporation.

2.3 FABRICATION

- A. Back out or kerf backs of standing and running trim wider than 5 inches, except members with ends exposed in finished work.
- 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.
- D. For decking and porch flooring installations, ensure surfaces are suitable for installation of decking and that adequate structural support has been provided.
 - 1. Standard Installation: Confirm that joists are spaced at 16 inches on center maximum, and are sloped at a minimum of 1/4 inch per foot away from the building.
 - 2. Forty-five Degree Angle Installation: Confirm that joists are spaced at 12 inches on center maximum, and are sloped at a minimum of 1/4 inch per foot away from the building.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed.
 - 1. Cut to required lengths and prime ends.
 - 2. Comply with requirements in Section 09911 "Exterior Painting."

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
 - 1. Do not use manufactured units with defective surfaces, sizes, or patterns.
- B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut exterior finish carpentry to fit adjoining work.
3. Refinish and seal cuts as recommended by manufacturer.
4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
5. Coordinate exterior finish carpentry with materials and systems in or adjacent to it.
6. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install cellular PVC trim to comply with manufacturer's written instructions.
- B. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary.
 1. Use scarf joints for end-to-end joints.
 2. Stagger end joints in adjacent and related members.
- C. Fit exterior joints to exclude water.
 1. Cope at returns and miter at corners to produce tight-fitting joints, with full-surface contact throughout length of joint.
 2. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.
- D. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3.5 DECKING INSTALLATION

- A. Decking Installation.
 1. Install with grain side up for the walking surface.
 2. Fasten tight to joists. Provide shims if there are variations in framing.
 3. Countersink fasteners slightly to provide necessary clearance when installing the next board.
 4. Cut final boards as required for proper appearance.
 5. Fasten with stainless steel screws, two per deck board into each joist

3.6 ADJUSTING

- A. Replace exterior finish carpentry that is damaged or does not comply with requirements.
 1. Exterior 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 exterior finish carpentry on exposed and semiexposed surfaces.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.

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 06201

SECTION 06 7300 – COMPOSITE DECKING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Composite Decking (Trex Select)

1.2 RELATED SECTIONS

- A. Section 06-1100 – Wood Framing

1.3 REFERENCES

- A. ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.
- B. ASTM D-7031-04: Standard Guide for Evaluating Mechanical and Physical Properties of Wood-Plastic Composite Products, ASTM International
- C. ASTM E-84-01: Test Method for Surface Burning Characteristics of Building Materials, ASTM International.
- D. ASTM D 570: Water Absorption of Plastics
- E. ASTM D 1761: Mechanical Fasteners in Wood
- F. ASTM D -1413-99: Test method for Wood Preservatives by Laboratory Soil-block Cultures
- G. ASTM C177: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

1.4 DESIGN/PERFORMANCE REQUIREMENTS

- A. Structural Performance:
 - a. Deck: Uniform Load – 100lbf/sq.ft.
 - b. Tread of Stairs: Concentrated Load: 750 lbf/sq.ft., and 1/8" max. deflection with a concentrated load of 300 lbf on area of 4 sq. in.
- B. Fire-Surface Burning Characteristics per ASTM E-84.

1.5 SUBMITTALS

- A. Product Data Indicate sizes, profiles, surface style, and performance characteristics
- B. Samples: For each product specified, one sample representing actual product color, size, and finish.

1.6 Delivery, Storage, and Handling

- A. Store Trex products on a flat and level surface. Adjust support blocks accordingly

- B. Support Trex bundles on supplied dunnage
- C. When stacking Trex bundles, supports should start approximately 8" from each end and be spaced approximately 2ft on center. Supports should line up vertically/perpendicular to the decking product.
- D. Do not stack Trex Select decking more than 14 bundles.
- E. Keep material covered using the provided bundle cover until time of installation.
- F. See [www. Trex.com](http://www.Trex.com) for detailed storage recommendations;
 - a. <http://s7d4.scene7.com/is/content/Trex/Installation%20Guide%202013pdf>

1.7 Warranty

- A. Provide manufactures warranty against rot, decay, splitting, checking, splintering, fungal damage, and termite damage for a period of 25 years for a residential installation and 10 years for a commercial installation. In addition, provide the Trex Fade and Stain Warranty against food staining and fading beyond 5 Delta E (CIE units) for a period of 25 years for a residential installation and 10 years for a commercial installation. Specific terms for warranties can be found at; www.Trex.com.

PART 2 PRODUCTS

2.1 Manufacturers

- A. Contract Documents are based on products supplied by; Trex Company, Inc., 160 Exeter Dr., Winchester, VA 22603.
- B. Substitutions: Not permitted under Division 01

2.2 Applications/Scope

- A. Wood-Plastic Composite Lumber;
 - a. Material Description: Composite Decking consisting of recycled Linear Low-Density Polyethylene (LLDPE) and recycled wood. The product is extruded into shapes and sizes as follows:
 - i. Trex Select Decking Boards; 0.875" x 5.5".
 - ii. Lengths – 12, 16, and 20 feet
 - iii. Color – To be specified by owner from Trex' standard list of colors.
 - b. Physical and Mechanical Properties as follows:

Test	Test Method	Value	
Flame spread	ASTM E 84	85	
Thermal Expansion	ASTM D 1037	1.9 x 10-5 inch/inch/degreeF	
Moisture Absorption	ASTM D 1037	< 1.2%	
Screw Withdrawal	ASTM D1761	388 lbs/in	
Fungus Resistance	ASTM D1413	Rating - no decay	

Termite Resistance	AWPAE1-72	Rating = 9.7	
		<u>Ultimate (Typical)Values</u> *	<u>Design Values</u>
Compression Parallel	ASTM D198	1588 psi	540 psi
Compression Perpendicular	ASTM D143	1437 psi	540 psi
Bending Strength	ASTM D198	3280 psi	500 psi
Shear Strength	ASTM D143	1761 psi	360 psi
Modulus of Elasticity	ASTM D4761	400,000psi	200,000 psi
Modulus of Rupture	ASTM D4761	3750 psi	500 psi

* Ultimate strength values are not meant for design analysis. Design values are for temperatures up to 130F (54C)

2.2 Accessories

A. Fasteners:

- a. Trex Universal Hideaway Hidden Fasteners
- b. Screws; See - <http://s7d4.scene7.com/is/content/Trex/Installation%20Guide%202013pdf> for the updated recommendations on fasteners.

PART 3 EXECUTION

3.1 Installation

- A. Install according to Trex installation guidelines.
<http://s7d4.scene7.com/is/content/Trex/Installation%20Guide%202013pdf>
- B. Cut, drill, and rout using carbide tipped blades
- C. Do not use composite wood material for structural applications

3.2 Cleaning

- A. Following cleaning recommendations as found in Trex installation guide at;
<http://s7d4.scene7.com/is/content/Trex/Installation%20Guide%202013pdf>

END OF SECTION 06150

SECTION 07 1616 – CRYSTALLINE WATERPROOFING

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 crystalline waterproofing. On exposed faces of existing masonry walls (stone and brick).
- B. System description: crystalline type that is a blend of Portland cement, fine treated silica sand and active proprietary chemicals. When mixed with water and applied as a cementitious coating, the active chemicals diffuse into the concrete and cause a catalytic reaction which generates a non-soluble crystalline structure within the pores and capillary tracts of concrete. This crystalline system causes the concrete to become sealed against the penetration of liquids from any direction, and protects the concrete from deterioration due to harsh environmental conditions.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Applicator.
- B. Manufacturer's Certification: Provide document signed by manufacturer or manufacturer's representative certifying that the materials to be installed comply with the requirements of this specification
- C. Manufacturer's Field Report: Provide copy of report from manufacturer's representative confirming that the surfaces to which waterproofing material is to be applied are in a condition suitable to receive same.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be ISO 9001 registered, and shall have no less than 10 years' experience in manufacturing the cementitious crystalline waterproofing materials for the required work. Manufacturer must be capable of providing field service representation during construction phase. Manufacturers who

cannot provide ongoing field support or the performance test data specified herein will not be considered for the project.

- B. Applicator: Waterproofing applicator shall be experienced in the installation of cementitious crystalline waterproofing materials as demonstrated by previous successful installations, and shall be approved by the manufacturer in writing.
- C. Technical Consultation: The waterproofing manufacturer's representative shall provide technical consultation on waterproofing application and provide on-site support as needed

1.6 FIELD CONDITIONS

- A. Comply with manufacturer's product data regarding condition of substrate to receive waterproofing, weather conditions before and during installation, and protection of the installed waterproofing system.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer shall provide standard product warranty executed by authorized company official.
- B. Applicator's Warranty: Applicator shall warrant the waterproofing installation against defects caused by faulty workmanship or materials for a period of typically (specify term) years from Date of Substantial Completion. The warranty will cover the surfaces treated and will bind the applicator to repair, at his expense, any and all leaks through the treated surfaces which are not due to structural weaknesses or other causes beyond applicator's control such as fire, earthquake, tornado and hurricane. The warranty shall read as follows:

Warranty: The applicator warrants that, upon completion of the work, surfaces treated with cementitious crystalline waterproofing will be and will remain free from water leakage resulting from defective workmanship or materials for a period of (specify term) years from Date of Substantial Completion. In the event that water leakage occurs within the warranty period from such causes, the applicator shall, at his sole expense, repair, replace or otherwise correct such defective workmanship or materials. Applicator shall not be liable for consequential damages and applicator's liability shall be limited to repair, replacement or correcting of defective workmanship or materials. Applicator shall have no responsibility with respect to water leakage or other defects caused by structural failure or movement of the structure, or any other causes beyond Applicator's control

PART 2 - PRODUCTS

2.1 WATERPROOFING MATERIALS

- A. Basis of design: The following products manufactured by Xypex Chemical Corporation

1. Xypex Concentrate
2. Xypex Megamix I
3. Xypex Xycrylic Admix

B. Other acceptable manufacturers:

1. American Permaquick Inc
2. Anti-Hydro International Inc
3. Koster American Corporation

C. Obtain all proprietary crystalline waterproofing products from a single manufacturer:

2.2 ACCESSORY MATERIALS

- A. Water: Potable.

2.3 MIXES

- A. Crystalline Waterproofing: Add prepackaged dry ingredients to water according to manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to waterproofing installation, arrange visit to project site with waterproofing manufacturer's representative. Representative shall inspect and certify that concrete surfaces are in acceptable condition to receive waterproofing treatment.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions.
- B. Protect other work from damage caused by cleaning, preparation, and application of waterproofing. Provide temporary enclosure to confine spraying operation and to ensure adequate ambient temperatures and ventilation conditions for application.
- C. Thoroughly clean and profile all surfaces. The surface must also have an open capillary system to provide "tooth and suction" for the Xypex treatment. A minimum of CSP-3 per the International Concrete Repair Institute Concrete Surface Profile Chips or other equivalent standard is required
- D. Wet surface of masonry until a saturated surface dry (SSD) condition is obtained. Dry substrates will not absorb any additional water but has no glistening water on its surface. Maintain the masonry in an SSD condition until waterproofing is applied.

- E. Apply one coat of Xypex Concentrate per manufacture's specification
- F. Allow to set and harden for between 12 hours and 24 hours. During this period moist cure per manufacturer's product data sheet.
- G. Mix Xypex Megamix I and Xycrylic Admix per Manufacturer's instructions.
- H. Apply one coat of mix over waterproofing at a thickness of 1/8-inch.
- I. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed application of waterproofing.
- J. Prepare test and inspection reports.

END OF SECTION 07 1616

SECTION 07 2500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. A complete weather barrier assembly for vertical building envelope protection that will maintain air/moisture resistance while maintaining moisture-vapor permeability. The assembly consists of the following components.
 - 1. Weather barrier membrane
 - 2. Seam Tape
 - 3. Flashing
 - 4. Fasteners

1.2 REFERENCES

- A. ASTM International
 - 1. ASTM C 920; Standard Specification for Elastomeric Joint Sealants
 - 2. ASTM C 1193; Standard Guide for Use of Joint Sealants
 - 3. ASTM D 882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - 4. ASTM D 1117; Standard Guide for Evaluating Non-woven Fabrics
 - 5. ASTM E 84; Test Method for Surface Burning Characteristics of Building Materials
 - 6. ASTM E 96; Test Method for Water Vapor Transmission of Materials
 - 7. ASTM E 1677; Specification for Air Retarder Material or System for Framed Building Walls
 - 8. ASTM E2178; Test Method for Air Permeance of Building Materials
 - 9. ASTM E2357; Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. AATCC – American Association of Textile Chemists & Colorists
 - 1. Test Method 127 Water Resistance: Hydrostatic Pressure Test
- C. TAPPI
 - 1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - 2. Test Method T-460; Air Resistance of Paper (Gurley Hill Method)

1.3 SUBMITTALS

- A. Refer to Section 01 3300 Submittal Procedures.
- B. Product Data: Submit manufacturer current technical literature for each component.
- C. Samples: Weather Barrier Membrane, minimum 8-1/2 inches by 11 inches.
- D. Quality Assurance Submittals

1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.
 2. Manufacturer Instructions: Provide manufacturer's written installation instructions.
 3. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather barrier assembly installation.
- E. Closeout Submittals
1. Weather Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion.
- 1.4 QUALITY ASSURANCE
- A. Qualifications
1. Installer shall have experience with installation of weather barrier assemblies under similar conditions.
 2. Installation shall be in accordance with weather barrier manufacturer's installation guidelines and recommendations.
 3. Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.
- B. Mock-up
1. Install mock-up using approved weather barrier assembly including fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations. Mock shall include portion of wall without penetrations and typical door and window openings.
 - a. Mock-up size: 8 feet by 8 feet.
 - b. Mock-up Substrate: Match wall assembly construction, including window opening.
 - c. Mock-up may not remain as part of the work.
 2. Contact manufacturer's designated representative prior to weather barrier assembly installation, to perform required mock-up visual inspection and analysis as required for warranty.
- C. Pre-installation Meeting
1. Hold a pre-installation conference, two weeks prior to start of weather barrier installation. Attendees shall include Contractor, Architect, installer, Owner's Representative, and weather barrier manufacturer's designated representative.
 2. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of weather barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and

coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 6000 Product Requirements.
- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by weather barrier manufacturer.

1.6 SCHEDULING

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.
- B. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation.

1.7 WARRANTY

- A. Special Warranty
 - 1. Weather barrier manufacturer's warranty for weather barrier for a period of ten (10) years from date of purchase.
 - 2. Pre-installation meetings and jobsite observations by weather barrier manufacturer for warranty is required prior to assembly installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. DuPont; 4417 Lancaster Pike, Chestnut Run Plaza 728, Wilmington, DE 19805; 1-800-44-TYVEK (8-9835); <http://www.construction.tyvek.com>

2.2 MATERIALS

- A. Basis of Design: spunbonded polyolefin, non-woven, non-perforated, weather barrier is based upon DuPont™ Tyvek® CommercialWrap® D and related assembly components.
- B. Performance Characteristics:
 - 1. Air Penetration: 0.001 cfm/ft² at 75 Pa when tested in accordance with ASTM E2178. Type 1 when tested in accordance with ASTM E 1677. ≤0.04 cfm/ft @ 75 Pa when tested in accordance with ASTM E2357.
 - 2. Water Vapor Transmission: 30 perms, when tested in accordance with ASTM E 96, Method B.
 - 3. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127.

4. Basis Weight: 2.4 oz/yd², when tested in accordance with TAPPI Test Method T-410.
5. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460.
6. Tensile Strength: 33/41 lbs/in., when tested in accordance with ASTM D 822, Method A.
7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84. Flame Spread: 15, Smoke Developed: 25.

2.3 ACCESSORIES

- A. Seam Tape: 3" DuPont™ Tyvek® Tape as distributed by DuPont.
- B. Fasteners: Provide fasteners to suit substrate and project conditions.
 1. Wrap Cap Screws: 1-5/8-inch rust resistant screw with 2-inch diameter plastic cap fasteners.
 2. Wrap Caps: #4 nails with large 1-inch plastic cap fasteners or 1-inch minimum plastic cap staple with leg length sufficient to achieve a minimum penetration of 5/8-inch into the wood stud.
 3. Masonry tap-con fasteners with Wrap Caps: 2-inch diameter plastic cap fasteners.
- C. Sealants: Provide sealants compatible with weather barrier assembly.
 1. Refer to Section 07 9200 Joint Sealants.
 2. Provide sealants that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions.
 3. Products:
 - a. DuPont™ Commercial Sealant.
 - b. Sealants recommended by the weather barrier manufacturer.
- D. Adhesives:
 1. Provide adhesives recommended by weather barrier manufacturer.
 2. Products:
 - a. Liquid Nails® LN-109
 - b. Denso Butyl Liquid
 - c. 3M High Strength 90
 - d. SIA 655
 - e. Adhesives recommend by the weather barrier manufacturer.
- E. Primers:
 1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.
 2. Products:
 - a. 3M High Strength 90
 - b. Denso Butyl Spray
 - c. SIA 655
 - d. Permagrip 105
 - e. Primers recommended by the flashing manufacturer

F. Flashing

1. DuPont™ FlexWrap™ NF: Flexible membrane flashing materials for window openings and penetrations.
2. DuPont™ StraightFlash™ VF: Dual-sided flashing membrane materials for brick mold and non-flanged windows and doors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

3.2 INSTALLATION - WEATHER BARRIER

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations
- B. Install weather barrier prior to installation of windows and doors.
- C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier
1. Exterior corners: minimum 12 inches.
 2. Seams: minimum 6 inches.
- H. Weather Barrier Attachment:
1. Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommend fasteners, space 6 -18 inches vertically on center along stud line, and 24 inches on center, maximum horizontally.
- I. Apply 4 inch by 7-inch piece of flashing or weather barrier manufacturer approved alternate to weather barrier membrane prior to the installation cladding anchors.

3.3 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.4 OPENING PREPARATION

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

3.5 FLASHING

- A. Cut 9-inch-wide flexible membrane flashing a minimum of 12 inches longer than width of sill rough opening.
- B. Cover horizontal sill by aligning flexible membrane flashing with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- C. Fan flexible membrane flashing at bottom corners onto face of wall. Firmly press in place.
- D. Apply 9-inch-wide strips of dual-sided flashing membrane at jambs. Align flashing with interior edge of jamb framing. Start flashing at head of opening and lap sill flashing down to the sill.
- E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.
- F. Install flashing membrane flashing at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
- G. Coordinate flashing with window installation.
- H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C 1193.
- I. Position weather barrier head flap across head flashing. Adhere using 4-inch wide dual-sided flashing membrane over the 45-degree seams.
- J. Tape top of window in accordance with manufacturer recommendations.
- K. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

3.6 FIELD QUALITY CONTROL

- A. Notify manufacturer's designated representative to obtain periodic observations of weather barrier assembly installation.

3.7 PROTECTION

- A. Protect installed weather barrier from damage.

END OF SECTION 07 2500

SECTION 07 4640 – VINYL SIDING AND SOFFITS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Vinyl siding.
- B. Vinyl soffits.
- C. Vinyl trim and accessories.

1.2 RELATED SECTIONS

- A. Section 06 1000 – Rough Carpentry: Framing and sheathing.
- B. Section 06 1600 – Sheathing
- C. Section 07 2500 – Weather Barriers

1.3 REFERENCES

- A. ASTM D 256 - Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- B. ASTM D 635 - Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supported Plastics in a Horizontal Position.
- C. ASTM D 638 - Test Method for Tensile Properties of Plastics.
- D. ASTM D 648 - Test Method for Deflection Temperature of Plastics Under Flexural Load.
- E. ASTM D 696 - Test Method for Coefficient of Linear Expansion of Plastics.
- F. ASTM D 1929 - Test Method for Ignition Properties of Plastics.
- G. ASTM D 2843 - Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
- H. ASTM D 3679 - Specification for Rigid Poly Vinyl Chloride (PVC) Siding.
- I. ASTM D 4226 - Test Methods for Impact Resistance of Rigid Poly Vinyl Chloride (PVC) Building Products.
- J. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Samples: Siding/soffit design, size, and color for approval. Submit two samples, full size x 2 foot long of each siding, soffit, and accessory type in selected colors.

- C. Manufacturer's installation instructions.
- D. Certificate: Manufacturer's certification that siding/soffit as supplied meets or exceeds the conditions specified herein.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Maintain rigorous production quality control standards to ensure that vinyl siding and soffit will perform as expected for its intended use.
- B. Regulatory Requirements:
 - 1. International Building Code – 2012 with CT Supplements.
 - 2. CHFA Construction Guidelines - 2018.
 - 3. HUD-FHA Minimum Property Standards.
 - 4. Underwriters Laboratories Listing R14214.
 - 5. ICC - ESR-1258, ESR 1133.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Pack siding and soffits two squares per carton and clearly mark each carton with manufacturer's name, siding style, color, identifying lot number, and VSI Certification Stamp.
- C. Store vinyl siding, soffits, and accessories in clean, dry area, out of direct sunlight.
- D. Handle material to prevent damage. Do not allow cartons to crease.

1.7 WARRANTY

- A. Upon completion, provide a written transferable, lifetime limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Alside / Siding, which is located at: P. O. Box 2010; Akron, OH 44309; Toll Free Tel: 800-922-6009; Tel: 330-922-5350; Fax: 330-922-5387; Web:www.alside.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 6000.

2.2 MATERIALS

- A. Vinyl Siding and Soffits - General Requirements: Produced from polyvinyl chloride (PVC) compounds meeting ASTM D 3679 requirements for compound class 2.
 - 1. Vinyl Siding Institute Certified.
 - 2. Average Impact Strength: 3.86 ft. lbs./in. of notch at 73.4 degrees F, per

- ASTM D 256.
3. Average Impact Strength: 2.4 ft. lbs./in. of notch at 32 degrees F, per ASTM D 256.
 4. Tensile Strength: 6,700 psi (46,195 kPa), per ASTM D 638.
 5. Modulus of Elasticity: 410,000 psi, per ASTM D 638.
 6. Deflection Temperature: 170 degrees F, per ASTM D 648.
 7. Fire Properties:
 - a. Average Time of Burning: Less than 5 seconds, when tested in accordance with ASTM D 635.
 - b. Average Extent of Burning: Less than 5 mm, when tested in accordance with ASTM D 635.
 - c. Flame Spread Index: 20 (Class A), when tested in accordance with ASTM E 84.
 - d. Smoke Developed Index: Less than 450, when tested in accordance with ASTM E 84.
 - e. Ignition Temperature: When tested in accordance with ASTM D 1929, no self ignition and no flaming; no smoldering at less than 680 degrees F.
 8. Typical Vinyl Siding Properties:
 - a. Camber: Alside sidings and soffits meet all requirements for camber per ASTM D 3679.
 - b. Heat Shrinkage: Alside sidings and soffits meet all requirements for heat shrinkage per ASTM D 3679.
 - c. Impact Resistance: 60 in-lbf, per ASTM D 4226, Procedure A, H.25.
 - d. Weatherability: No surface or structural defects such as peeling, cracking, or chipping when tested per ASTM D 3679.
 - e. Coefficient of Linear Expansion: 3.05 by 10⁻⁵ in/in F, per ASTM D 696.
 - f. Gloss: Alside sidings and soffits meet all requirements.
 - g. Surface Distortion: No distortion at 120 degrees F, per ASTM D 3679.
 9. Interlock: Post-form style lock with positive interlock; both ends of panels factory cut and notched for overlap.
 10. Nail Slots: Elongated 1-inch slots spaced approximately 1/4 inch apart in nailing hem to allow for expansion and contraction.
 11. Weep Holes: Small holes under the bottom butt of siding panels to prevent vapor build-up and allow accumulated moisture to escape.

2.3 SIDING

- A. Horizontal Vinyl Siding: Charter Oak triple 4 1/2-inch exposure solid soffit/vertical.
 1. 4 1/2-inch exposure dutch lap profile.
 2. Each 9-inch-wide horizontal siding panel nominally configured as two 4 1/2-inch panels in dutch lap style with 3/4-inch butt height.
 3. Tri Beam panel reinforcement system with double thick rolled over nail hem.
 4. Length: 12 feet 0 inches
 5. Field Butt Height: 3/4 inch.
 6. Thickness: 0.042 inch.
 7. Lo-gloss finish.
 8. Color: As selected by Architect from manufacturer's standards.

2.4 SOFFIT

- A. Vinyl Soffit: Charter Oak T3.33 inch invisibly vented, reinforced soffit.
 - 1. Each 10-inch-wide panel nominally configured as three 3.33-inch panels in both aerated and solid panels with 3/4-inch (19 mm) butt height.
 - 2. Aerated panels invisibly perforated with 3.2 sq. inch net free area per l/ft.
 - 3. TriBeam panel reinforcement system.
 - 4. Length: 12 feet 0 inches.
 - 5. Width: 10 inches.
 - 6. Thickness: 0.042 inch.
 - 7. Color: As selected by Architect from manufacturer's standards.

2.5 ACCESSORIES

- A. Wide Pocket Accessories: Refer to drawings & details for locations and applications. Accessories shall include all available manufacturer's products for the specified siding types, and include but not be limited to the following:
 - 1. 4-inch traditional outside corner post with foam insert
 - 2. 3-inch beaded corner starter
 - 3. 3.5, 5, and 7 inch lineal
 - 4. 1-1/2-inch j-channel
 - 5. Two-piece j-channel
 - 6. Wide pocket J-channel
 - 7. Prodigy starter

PART 3 EXECUTION

3.1 EXAMINATION

- A. Confirm that all critical dimensions are as specified on the drawings.
- B. Beginning installation indicates Installer's acceptance of substrate as suitable to accept siding and soffits.

3.2 PREPARATION

- A. Repair substrate flaws or defects before applying siding or soffits.
- B. Where necessary, fur surfaces to an even plane and free from obstructions before application.

3.3 INSTALLATION

- A. Install siding and soffits in accordance with the latest edition of "Vinyl Siding Installation Manual," published by the Vinyl Siding Institute (VSI) and special details from the drawings.
- B. Basic Installation Guidelines are as follows: The following rules, which are stated in the Vinyl Institute Guidelines are critical for proper vinyl siding installation.
 - 1. Installed panels and accessories must move freely from side to side.
 - 2. When installing a siding panel, push up from the bottom until the lock is fully engaged with the piece below it. Without stretching the panel, reach up and

fasten it into place

3. Fasten nails or other fasteners in the center of the nailing slot and make sure the fastener penetrates at least 1 ¼" through wood sheathing into framing.
 4. Do not force the panels up or down when fastening in position.
 5. Do not drive the head of the fastener tightly against the siding nail hem. Allow approximately 1/32" clearance between the fastener head and the siding panel. Make sure the panel can move freely back and forth. Drive fasteners straight and level to prevent distortion and buckling of the panel.
 6. Leave a minimum of ¼" clearance at all openings and stops to allow for normal expansion and contraction. When installing in temperatures for 40 degrees, increased minimum clearance to 3/8".
 7. Do not caulk the panels when they meet the receiver of inside corners, outside corners, or J-trim. Do not caulk the overlap joints.
 8. Do not face-nail or staple through siding. Vinyl siding expands and contracts with outside temperature changes. Face-nailing can result in ripples in the siding.
 9. Removal of existing siding is necessary take appropriate actions to ensure a smooth and continuous surface.
 10. Inspect substrate and ensure sheathing is even, smooth & uninterrupted. Repair as necessary per Section 06160 – Sheathing
 11. Installation of the specific products may differ in details from these instructions. Follow the manufacturer's instructions, using parts specified by the manufacturer, to ensure proper installation.
- C. Install vinyl siding, soffits, and accessories in accordance with best practice, with all joint members plumb and true.
- D. Fasteners shall be in accordance with the Fastener Schedule for siding attachment on the drawings.

3.4 FIELD QUALITY CONTROL

- A. After installation of siding and soffits, check entire surface for obvious flaws or defects.
- B. Replace and repair any problem areas, paying close attention to the substrate for causes of the problem.

3.5 CLEANING

- A. After application of siding and soffits, clean as necessary to remove all fingerprints and soiled areas.
- B. Upon completion of siding application, clean entire area, removing all scrap, packaging, and unused materials related to this work.

END OF SECTION 07 4640

SECTION 07 9200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 CONDITIONS AND REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division 1 – General Requirements apply.

1.2 SECTION INCLUDES

- A. Joint sealants for the following applications, including those specified by reference to this Section:
 - 1. Silicone Joint Sealants.
 - 2. Urethane Joint Sealants.
 - 3. Latex Joint Sealants.
 - 4. Butyl Sealants.
 - 5. Joint Sealant Backing.
 - 6. All other accessories as required for a complete installation.

1.3 RELATED SECTIONS

- A. Section 08 1113 – Hollow Metal Doors and Frames
- B. Section 09 2900 – Gypsum Board

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM C834, Specification for Latex Sealing Compounds.
 - 2. ASTM C919, Practice for Use of Sealants in Acoustical Applications.
 - 3. ASTM C920, Specification for Elastomeric Joint Sealants.
 - 4. ASTM C1193, Guide for Use of Joint Sealants.
 - 5. ASTM C1248, Test Method for Staining of Porous Substrate by Joint Sealants.
 - 6. ASTM C1311, Specification for Solvent Release Sealants.
 - 7. ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 - 8. ASTM E90, Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- B. Federal Specifications (FS):
 - 1. FS TT-S-00230C(2), Sealing Compound; Elastomeric Type, Single Component (for Calking, Sealing, and Glazing in Buildings or Other Structures).

1.5 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 3300.
- B. Product Data: For each joint-sealant product indicated.
 - 1. Include printed statement of VOC content and material safety data sheets.
- C. Samples: For each type and color of joint sealant required, provide samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Preconstruction field test reports.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company experienced in manufacturing products similar to those specified for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required products.
- B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C1193 that is appropriate for the types of Project joints. Follow manufacturer's recommendations for preparation of substrates and installation of primers.
- C. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
 - 1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS

- A. Low-Emitting Materials: Sealants shall comply with the following limits for VOC content:
1. Architectural Sealants: 250 g/L.
 2. Nonmembrane Roof Sealants: 300 g/L.
 3. Single-Ply Roof Membrane Sealants: 450 g/L.
 4. Other Sealants: 420 g/L.
 5. Sealant Primers for Nonporous Substrates: 250 g/L.
 6. Sealant Primers for Porous Substrates: 775 g/L.
 7. Modified Bituminous Sealant Primers: 500 g/L.
 8. Other Sealant Primers: 750 g/L.
- B. Low-Emitting Materials:
1. Exterior reactive sealants shall have a VOC content of not more than 50 g/L or 4 percent by weight, whichever is greater.
 2. Other exterior caulks and sealants shall have a VOC content of not more than 30 g/L or 2 percent by weight, whichever is greater.
 3. Interior sealants 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."
- C. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.

2.2 EXTERIOR JOINT SEALANTS

- A. Exterior Movement Joints in Brick or Stone Masonry:
1. Single-component, neutral-curing, non-staining silicone sealant, ASTM C920, Type S; Grade NS; Class 50; for Use NT.
 - a. Products: One of the following:
 - 1) Tremco Inc; Spectrem 2 or Spectrem 3.
 - 2) Pecora Corporation; 864NST or 895NST.
 - 3) Dow Corning Corporation; DOWSIL 795.
- B. Exterior Joints Between Dissimilar Materials and All Other Non-Traffic Joints Where Another Type Is Not Specified:
1. Single-Component neutral-curing, non-staining silicone sealant. ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - a. Products: One of the following:

- 1) Tremco Inc; Spectrem 1 or Spectrem 2.
- 2) Pecora Corporation; 890NST.
- 3) Dow Corning Corporation; DOWSIL 791.

C. Sealant for Exterior Traffic-Bearing Joints, Where Slope Precludes Use of Pourable Sealant:

1. Single-component, nonsag urethane sealant, ASTM C920, Type S; Grade NS; Class 25; for Use T.
 - a. Products: One of the following:
 - 1) Tremco Inc; Vulkem 116.
 - 2) BASF Building Systems; Sonolastic NP1.
 - 3) Sika Corporation, Construction Products Division; Sikaflex - 1a.

D. Sealant for Exterior Traffic-Bearing Joints, Where Slope Allows Use of Pourable Sealant:

1. Single-component, pourable urethane sealant, ASTM C920, Type S; Grade P; Class 25; for Use T.
 - a. Products: One of the following:
 - 1) Tremco Inc; Vulkem 45.
 - 2) Pecora Corporation; Urexpan NR-201.
 - 3) BASF Building Systems; Sonolastic SL 1.

2.3 INTERIOR JOINT SEALANTS

A. Sealant for Use in Interior Joints in Ceramic Tile and Other Hard Non-Porous Surfaces in Kitchens and Toilet Rooms and Around Plumbing Fixtures:

1. Single-component, mildew-resistant silicone sealant, ASTM C920, Type S; Grade NS; Class 25; for Use NT; formulated with fungicide.
 - a. Products: One of the following:
 - 1) Tremco Incorporated; Tremsil 200 Sanitary.
 - 2) Pecora Corporation; 898.
 - 3) Dow Corning Corporation; DOWSIL 786.
 - 4) GE; Sanitary SCS1700.

B. Sealant for Interior Use Where Another Type is not Specified:

1. Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 - a. Products: One of the following:

- 1) Tremco Inc; Tremflex 834.
- 2) Pecora Corporation; AC-20+.
- 3) BASF Building Systems; Sonolac.

2.4 SEALANT FOR BEDDING DOOR THRESHOLDS

A. Butyl-Rubber Based Sealant for Bedding Door Thresholds:

1. ASTM 1311 one-part butyl rubber sealant ASTM C1311

a. Products: One of the following;

- 1) Tremco, Inc; Tremco Butyl Sealant.
- 2) Pecora Corp; BC-158
- 3) Dow Chemical Co; DOWSIL 335

B. Sealant Colors: As selected by Architects from manufacturer's full range of colors.

2.5 JOINT-SEALANT BACKING

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

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

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

2.6 MISCELLANEOUS MATERIALS

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

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

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

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
 - a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 2. Remove laitance and form-release agents from concrete.
 - a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer and based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
 - E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 - F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.
 - G. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.
 - H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.
 - I. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 07 9200

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Shop Drawings indicating sizes, profiles and details for doors, frames and anchors.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

- A. Manufacturers: Provide Doors and Frames by one of the following:
 - 1. Ceco Door Products; an Assa Abloy Group company.
 - 2. Curries Company; an Assa Abloy Group company.
 - 3. Pioneer Industries, Inc.
 - 4. Steelcraft; an Ingersoll-Rand company.
- B. Doors: Complying with SDI A250.8 for level and model and SDI A250.4 for physical-endurance level indicated, 1-3/4 inches (44 mm) thick unless otherwise indicated.
 - 1. Exterior Doors: Performance Level A (Extra Heavy Duty), minimum 16-gauge, Model 2 Seamless. Metallic coating, designation A60.
 - 2. Design: Flush Panel.
 - 3. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".
 - a. Provide 22-gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly. No stiffener face welding is permitted.
 - b. Thermal properties to rate at a fully operable minimum U-Factor 0.37 and R-Value 2.7, including insulated door, thermal-break frame and threshold.
 - 4. Hardware Reinforcement: Fabricate according to SDI A250.6 with reinforcement plates from same material as door face sheets.
- C. Frames: ANSI A250.8; conceal fastenings unless otherwise indicated.
 - 1. Steel Sheet for Exterior Frames: 14-gauge minimum thickness, ASTM A653, metallic coating designation A60.
 - 2. Exterior Frame Construction: Full profile welded.
 - 3. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

- 4. Frame Anchors: Not less than 0.042 inch thick.
- D. Door Silencers: Three on strike jambs of single-door frames and two on heads of double-door frames.
- E. Grout Guards: Provide where mortar might obstruct hardware operation.
- F. Prepare doors and frames to receive mortised and concealed hardware according to SDI A250.6 and BHMA A156.115.
- G. Reinforce doors and frames to receive surface-applied hardware.
- H. Prime Finish: Manufacturer's standard, factory-applied coat of lead- and chromate-free primer complying with SDI A250.10 acceptance criteria.

2.2 MATERIALS

- A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, A60.
- B. Frame Anchors: ASTM A 879/A 879M, 4Z coating designation; mill phosphatized.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install hollow metal frames to comply with SDI A250.11.
- B. Install doors to provide clearances between doors and frames as indicated in SDI A250.11.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying rust-inhibitive primer. Use galvanizing repair paint for metallic coated surfaces.

END OF SECTION 08 1113

SECTION 08 3113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing per the following:
 - 1. Horizontal Access Doors and Frames: NFPA 288.

2.2 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: One of the following:
 - 1. Acudor Products, Inc.
 - 2. Babcock-Davis.
 - 3. Karp Associates, Inc.
 - 4. Milcor Inc.
- B. Flush Access Doors with Exposed Flanges: Prime-painted steel units.
- C. Flush Access Doors with Concealed Flanges: Prime-painted steel units with drywall bead flange.
- D. Locks: Flush to finished surface, key operated.

2.3 MATERIALS

- A. Steel Sheets: ASTM A 1008/A 1008M or ASTM A 591/A 591M.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install access doors and panels accurately in position. Adjust hardware and door and panels for proper operation.

END OF SECTION 08 3113

SECTION 08 7100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the following:

1. Replacement lockset for existing exterior entry door at Rear Porch, including field verification, preparation and modification of existing door and frame to receive new door hardware.
2. Hardware for hollow metal door and frame at Basement.

1.2 RELATED SECTIONS

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

1.3 SECTION REQUIREMENTS

A. Submittals:

1. Product data for all specified hardware components.
2. Hardware schedule.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Accessibility Requirements: Door hardware on doors in an accessible route, comply with governing accessibility regulations.

PART 2 - PRODUCTS

2.1 HARDWARE

A. Hinges:

1. Manufacturers: One of the following:
 - a. IVES: 5BB Series
 - b. McKinney Products Company; an ASSA ABLOY Group company.
2. Stainless-steel hinges with stainless-steel pins for exterior doors.
3. Ball-bearing hinges for doors with closers and entry doors.
4. Three hinges for 1-3/4-inch-thick doors 90 inches or less in height; four hinges for doors more than 90 inches in height.

B. Mortise Locksets:

1. Manufacturers: One of the following:
 - a. Sargent 8200 Series
 - b. Schlage L9000 Series
2. BHMA A156.13, Series 1000, Grade 1.
3. Lever handles.

C. Cylindrical Locks

1. Manufacturers: One of the following:
 - a. Sargent 10 Line
 - b. Schlage ND Series
2. BHMA A156.2, Series 4000, Grade 1.
3. Lever Handles.

D. Key locks to Owner's existing master-key system.

E. Closers

1. Manufacturers: One of the following:
 - a. SARGENT 351 Series
 - b. LCN 4040 Series
2. Mount closers on interior side (room side) of door opening. Provide regular-arm, parallel-arm, or top-jamb-mounted closers as necessary.
3. Adjustable delayed opening (accessible to people with disabilities) feature on closers.

F. Provide wall stops or floor stops for doors without closers.

G. Thresholds, seals doors sweeps and gasketing.

1. Manufacturers: One of the following:
 - a. Pemko
 - b. Zero
2. Thermal Break

H. Silencers

1. Manufacturers:
 - a. Ives
 - b. Burns, Rockwood
2. Provide "push-in" type silencers for hollow metal frames.

3. Provide one silencer per 30 inches of height on each single frame, and two for each pair frame.
4. Omit where gasketing is specified.

I. Hardware Finishes:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Protection Plates: BHMA 630 (US32D)
4. Door Closers: Powder Coat to Match
5. Wall Stops: BHMA 630 (US32D)
6. Weatherstripping: Clear Anodized Aluminum
7. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

A. EXAMINATION

1. Field verify existing door and frame receiving new hardware. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
2. Field verify size and conditions of existing masonry opening receiving new door and frame.

B. PREPARATION

1. Where on-site modification of doors and frames is required:
 - a. Field modify and prepare existing door and frame for new hardware being installed.
 - b. When modifications are exposed to view, use concealed fasteners, when possible.
 - c. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware.

3.2 INSTALLATION

- A. Mount hardware in locations required to comply with governing regulations and according to SDI A250.8 and DHI WDHS.3.
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity 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.
- H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
- I. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- J. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- K. Thresholds: Set thresholds in full bed of butyl sealant.
- L. 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 may impede traffic or present tripping hazard.
- M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- N. Deliver keys to Owner.

3.3 HARDWARE SCHEDULE

A. Hardware Set No. 1 (Basement door to bulkhead):

3	Hinges	T4A3386	McKinney
1	Storeroom Lock	72 8204 LNP	Sargent
1	Surface Closer	351 PD10	Sargent
1	Threshold:	2010APK	Pemko
1	Head & Jamb Gasketing	2891 APK	Pemko
1	Sill Sweep	315	Pemko

B. Hardware Set No. 2:

- 1 Classroom Security Lock with Lever Handles (Bored or mortise type to suit existing door cutout – field verify)

END OF SECTION 08 7100

SECTION 09 0320 – PLASTER REPAIR

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Repair and replacement of interior plaster.
 - 2. Three elements of Repair scope are part of the Base Bid:
 - a. Restoring the wall surface integrity at holes or penetrations made in the interior face of exterior walls where finishes are identified to remain.
 - b. Joining new replacement finishes on the exterior walls to adjacent existing finishes.
 - c. Restoring the wall surface integrity at holes made for the convenience of other trades to access work concealed by finishes.
- B. Predominant non-wood ceiling finishes are believed to be Gypsum Wall Board. Ceiling repair techniques for plaster are described in the event that extant horizontal plaster is uncovered. Where replacement finishes are required, gypsum plaster is specified.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference at Project site.
 - 1. Review locations, methods, and procedures.
 - a. Differentiate between “old “plaster and surfaces with features or treatments that qualify as having historic interest.
 - b. Verify personnel, equipment, and facilities needed to make progress and avoid delays.
 - c. Confirm materials, application techniques, colors, patterns, and sequencing.
 - d. Fire-protection plan.
 - e. Fugitive dust control
 - f. Plasterwork historic treatment program where historic plaster is affected.
 - g. Coordination with other trades and building occupants.

1.3 SEQUENCING AND SCHEDULING

- A. Perform plaster repair in the following sequence, which includes work specified in this and other Sections:
 - 1. Remove existing surface-mounted objects and hardware that overlie plaster surfaces except items indicated to remain in place. Tag items with location identification and protect.
 - 2. Verify that temporary protection has been installed.
 - 3. Examine condition of substrate, available grounds, and mating plaster surfaces.
 - 4. Clean plaster surface and remove paint and other finishes to the extent required.

5. Repair and replace existing plaster and supports to the degree required for a uniform, tightly adhered surface on which to apply other finishes.
6. Cure repaired surfaces and allow them to dry for proper finishing.
7. Paint and apply other finishes.
8. Reinstall removed surface-mounted objects and hardware unless otherwise indicated.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include recommendations for product application and use.
- B. Shop Drawings:
 1. Flat-work repairs: use photographs and interior elevation drawings to document, delineate, and quantify repairs. Include a list or schedule to correlate with Unit Prices.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
 1. For Contractor, list comparable recent projects
 2. For plaster repair mechanics, identify comparable work performed.
 3. Plasterwork Historic Treatment Program: Indicate whether Contractor or labor force has ever participated in work controlled by a PHTP

1.6 QUALITY ASSURANCE

- A. Mockups: Prepare mockups in place for each type of plaster repair and reconstruction work to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
 1. Locate mockups on existing surfaces where directed by Architect.
 2. Simulate finished lighting conditions for review of mockups.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- B. Store materials on elevated platforms, under cover, and in a dry location with ambient temperatures continuously maintained at not less than 45 deg F.

- C. Store hydrated lime and factory-prepared lime putty in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- D. Store materials not in use in tightly covered containers.
- E. Store lime putty covered with water in sealed containers.
- F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.8 FIELD CONDITIONS

- A. Comply with plaster-material manufacturers' written instructions. For gypsum plaster, also comply with ASTM C 842 requirements.
- B. Temperatures: Maintain temperatures in work areas at not less than 55 deg F or greater than 80 deg F for at least seven days before application of plaster, continuously during application, and for seven days after plaster has set or until plaster has dried.
- C. Avoid conditions that result in plaster drying out too quickly.
 - 1. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
 - 2. Maintain relative humidity levels for prevailing ambient temperature that produce normal drying conditions.
 - 3. Ventilate work areas in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

PART 2 - PRODUCTS

2.1 LIME-PLASTER MATERIALS

- A. Hydrated Lime: ASTM C 206, Type S or Type N.
- B. Lime Putty: Slaked hydrated lime or factory-prepared lime putty according to ASTM C 1489.
- C. Sand Aggregates: ASTM C 897.
 - 1. Finish-Coat Sand: Match size, texture, and gradation of existing sand as closely as possible. Blend several sands if necessary to achieve suitable match.
- D. Pigments for Colored Plaster: ASTM C 979/C 979M and having a record of satisfactory performance in lime plaster.
- E. Fiber: 1/2 to 1 inch in length; composed of alkali-resistant glass or polypropylene fiber; free of grease, waxes, and oils; and beaten well to separate fibers before blending into unfibered plaster material.

1. Proportion of Fiber to Unfibred Plaster Material: 3.5 oz./cu. ft. of unfibred plaster material, adjusted as required to produce a well-dispersed, cohesive, spreadable, stiff mix with fibers uniformly distributed.
- F. Fabric Reinforcing: Coarse, open-weave, alkali-resistant fiberglass or polypropylene fabric; free of grease, waxes, and oils.

2.2 GYPSUM PLASTER MATERIALS

A. Gypsum Materials:

1. Lightweight Gypsum Ready-Mixed Plaster: ASTM C 28/C 28M, with mill-mixed perlite aggregate.
2. Gypsum Neat Plaster: ASTM C 28/C 28M for use with job-mixed aggregates.
3. Gypsum Wood-Fibred Plaster: ASTM C 28/C 28M.
4. High-Strength Gypsum Neat Plaster: ASTM C 28/C 28M; with a minimum, average, dry compressive strength of 2800 psi per ASTM C 472 for a mix of 100 lb of plaster and 2 cu. ft. of sand.
5. Gypsum Gaging Plaster. ASTM C 28/C 28M.
6. High-Strength Gypsum Gaging Plaster: ASTM C 28/C 28M; with a minimum, average, dry compressive strength of 5000 psi per ASTM C 472 for a neat mix.
7. Gypsum Ready-Mixed Finish Plaster: ASTM C 28/C 28M; manufacturer's standard, mill-mixed, gaged, interior finish.
8. Gypsum Keene's Cement: ASTM C 61/C 61M.

B. Hydrated Lime: ASTM C 206, Type S or Type N.

C. Aggregates:

1. Aggregate for Base-Coat Plasters: ASTM C 35, perlite.

D. Fiber: 1/2 to 1 inch in length; composed of glass or polypropylene fiber; free of grease, waxes, and oils; and beaten well to separate fibers before blending into unfibred plaster material.

1. Proportion of Fiber to Unfibred Plaster Material: 3.5 oz./cu. ft. of unfibred plaster material, adjusted as required to produce a well-fibred, cohesive, spreadable, stiff mix with fibers uniformly distributed.

E. Fabric Reinforcing: Coarse, open-weave, alkali-resistant fiberglass or polypropylene fabric; free of grease, waxes, and oils.

F. Bonding Compound: ASTM C 631.

2.3 LATH

A. Wood Lath: 1/4 inch by 1-1/4 inch sound, straight-grained, wood strips.

B. Metal Lath:

1. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet, ASTM A 653/A 653M, G60, hot-dip galvanized zinc coated.
 - a. Paper Backing: Kraft paper factory bonded to back of lath.

- b. Diamond-Mesh Lath: Flat, 2.5 lb/sq. yd.

2.4 TRIM ACCESSORIES

- A. General: According to ASTM C 841 for gypsum plaster; coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
 - 1. Cornerite: Fabricated from expanded-metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 - 2. Striplath: Fabricated from expanded-metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 - 3. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
 - a. Small nose cornerbead with expanded flanges; use unless otherwise indicated.
 - b. Small nose cornerbead with perforated flanges; use on curved corners.
 - c. Small nose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
 - d. Large nose corner bead with perforated flanges use on wall/window jamb transitions.
 - 4. Casing Beads: Fabricated from zinc; square-edged style; with expanded flanges.
 - 5. Control Joints: Fabricated from zinc or zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 - 6. Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.

2.5 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fasteners for Attaching Lath to Substrates:
 - 1. For Lime Plaster: ASTM C 1063.
 - 2. For Gypsum Plaster: ASTM C 841.
 - 3. For Wood Lath: ASTM C 841 requirements for wood-floor-runner or wood-furring fasteners unless otherwise indicated on Drawings.
- C. Wire Ties: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.
- D. Plaster-Stabilization Materials: Acrylic emulsion(s) and related installation products shall have proven effectiveness in reattaching delaminated plaster and shall have been used previously by installing Contractor with successful results.

1. Acrylic Emulsion(s), General: Aqueous emulsion(s) of acrylic polymer, adhesive to plaster and plaster substrates, nontoxic, and non-reemulsifiable after curing.
 2. Prewet Solution: Low-viscosity acrylic emulsion.
 3. Adhesive: Thickened acrylic emulsion; thickener as recommended in writing by resin manufacturer.
- E. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
1. Previous effectiveness in performing the work involved.
 2. Little possibility of damaging exposed surfaces.
 3. Consistency of each application.
 4. Uniformity of the resulting overall appearance.
 5. Do not use products or tools that could do the following:
 - a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
 - b. Leave an unintended residue on surfaces.

PART 3 - EXECUTION

3.1 HISTORIC TREATMENT OF PLASTER, GENERAL

- A. Appearance Standard: Completed work is to have a uniform appearance as viewed by Architect from building interior at 5 feet away from surface.
- B. Wall surfaces are anticipated to be lime plaster and will be repaired in-kind. Replication of ornamental work, if any, will be gypsum plaster.
- C. General: In treating plaster, disturb it as minimally as possible and as follows unless otherwise indicated:
 1. Cut loose, damaged, or deteriorated plaster, lath, and support systems that cannot be repaired.
 2. Verify extent of plaster deterioration or removals against that indicated on Drawings. Consult Architect on types and extent of required work.
 3. Verify that substrate surface conditions are suitable for repairs.
 4. Provide lath, furring, and support systems for plaster included in the work of this Section.
 5. Replace lost details in new, wet-applied and cast plaster that replicate existing or indicated plaster configurations.
 6. Leave repaired plasterwork in proper condition for painting or applying other finishes as indicated.
 7. Install temporary protective measures to protect historic surfaces that shall be treated later.
- D. Illumination: Perform plastering work with adequate, uniform illumination that does not distort the flatness or curvature of surfaces.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate and environmental conditions, installation tolerances, and other conditions affecting performance of the Work.
 - 1. If existing substrates cannot be prepared to an acceptable condition for plastering work, notify Architect in writing.
 - 2. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
- B. Masonry Substrates: Verify that mortar joints are struck flush. Notify Architect of undocumented masonry substrate without flush joints. Proceed with plastering as directed by Architect.
- C. Begin plastering work only after unsatisfactory conditions have been corrected.

3.3 PREPARATION FOR PLASTERING

- A. Substrates: Prepare according to plaster manufacturer's written instructions and as follows:
 - 1. Clean surfaces to remove dust, loose particles, grease, oil, incompatible curing compounds, form-release agents, and other foreign matter and deposits that could impair bond with plaster.
 - 2. Remove ridges and protrusions greater than 1/8 inch and fill depressions greater than 1/4 inch with patching material. Allow to set and dry.

3.4 PLASTER REMOVAL AND REPLACEMENT, GENERAL

- A. Cut plaster that is damaged or deteriorated to the limits indicated. Carefully cut areas along straight edges that lie over supports, without damaging surrounding plasterwork.
- B. Maintain lath and supporting members in an undamaged condition so far as practicable. Cut damaged lath and supports that cannot be repaired or resecured and replace with new work of same type.
- C. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
- D. Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
- E. Clean substrate surfaces to remove grease, waxes, oils, waterborne staining, debris, and other foreign matter and deposits that could impair bond with repair material.
- F. Wet substrate before plaster application with latex acrylic bonding agent. Keep substrate damp to the touch but without visible droplets.

- G. Dampen the face of plaster abutting the replacement plaster before installing new plasterwork.
- H. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
- I. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

3.5 FLAT LIME-PLASTER REMOVAL AND REPLACEMENT

- A. General: Cut deteriorated plaster to existing sound plaster at locations indicated on Drawings.
 - 1. Inspect for lath deterioration. If any, replace lath.
 - 2. Sand bonding surfaces of repair area, and clean the surface with a nonmetallic bristle brush.
 - 3. Wet substrate to damp condition with latex acrylic bonding agent, but without visible droplets, then install new plaster to original profiles.
- B. Lime-Plaster Base Coats:
 - 1. Scratch Coat: 1 part lime putty, 2-1/2 parts base-coat sand, and fiber. Add fiber to mix and evenly distribute it without clumps just before spreading.
 - 2. Brown Coat: 1 part lime putty, 3 parts base-coat sand.
- C. Lime-Plaster Finish Coats:
 - 1. Finish-Coat Mix for Smooth-Troweled Finish: As required to match finish of design reference sample for estimating purposes, assume 3 parts lime putty, 1 part finish-coat sand.
 - 2. Finish-Coat Mix for Smooth-Float Finish: 1 part lime putty, 1 part finish-coat sand.
- D. Lime-Plaster Finishes: Match finish(es) of design reference sample(s).
 - 1. Provide smooth-troweled finish where indicated. Apply in three layers to match adjacent existing plaster thickness.
 - 2. Provide smooth-float finish where indicated. Apply in three layers to match adjacent surfaces.
- E. Hairline cracking within the plaster or plaster separation at edge of a replacement is unacceptable. Completely remove such work and reinstall or repair as a crack repair.

3.6 FLAT GYPSUM-PLASTER REMOVAL AND REPLACEMENT

- A. General: Cut deteriorated plaster to existing sound plaster. Use replacement plaster mixes of gypsum, lime, and aggregate; and application according to ASTM C 842 unless otherwise indicated.
 - 1. Inspect for lath deterioration. If any, replace lath.

2. Sand or scratch-brush bonding surfaces of repair area, and clean the surface with a nonmetallic bristle brush.
 3. Saturate substrate with acrylic latex bonding agent without visible water droplets, then install new plaster to original profiles. Refresh bonding agent with each coat.
- B. Bonding Compound: Apply on brick and plaster bases.
- C. Gypsum-Plaster Base Coats:
1. Base Coats over Wood Lath: Gypsum lightweight ready-mixed plaster with fiber.
 2. Base Coats over Expanded-Metal Lath: High-strength gypsum plaster with job-mixed sand for scratch and brown coats. Add fiber to scratch coat.
 3. Base Coats over Unit Masonry: lightweight ready-mixed plaster.
- D. Gypsum-Plaster Finish Coats:
1. Finish-Coat Mix for Smooth-Troweled Finishes: High-strength gypsum gaging plaster.
 2. Finish-Coat Mix for Float Finishes: Gypsum gaging plaster.
- E. Gypsum-Plaster Finishes: Match finish(es) of design reference sample(s).
1. Provide troweled finish unless otherwise indicated.
 2. Provide float finish where indicated.

3.7 REMOVING AND INSTALLING LATH AND ACCESSORIES

- A. General: Cut existing plaster as to expose deteriorated or rusted lath, wire ties, and support system, back to firm substrates and supports. Repair with new materials, well secured to existing lath in good condition and to building structure.
1. Cutting: Cut lath so it can be taken out completely from one support to the next. Cut to avoid cracking surrounding plaster.
 2. Cut out existing base-coat plaster beyond the edges of the new lath to permit new plaster to extend onto the old lath. Then step subsequent plaster coats to permit new plaster to extend over the old material.
 3. Fasten new lath to support system and to good existing lath. Wire tie at least every 6 inches.
 4. Install new lath according to ASTM C 1063 for lime plaster and ASTM C 841 for gypsum plaster.
- B. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
- C. Wood Lath: Install wood lath in same orientation and spacing as remaining wood lath and with lath ends supported by furring or framing. Stagger ends of adjacent laths over different supports, not aligned, and secure with fasteners at each end and spaced a maximum of 24 inches o.c. into supports.
- D. Metal Lath: Install according to ASTM C 1063 for lime plaster and ASTM C 841 for gypsum plaster.

1. Partition Framing and Vertical Furring: Install flat diamond-mesh lath.
2. Flat-Ceiling and Horizontal Framing: Install flat diamond-mesh lath.
3. Curved-Ceiling Framing: Install flat diamond-mesh lath.
4. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.8 PATCH REPAIR

- A. General: Patch voids, fractured surfaces, and crushed areas in otherwise sound plaster that are larger than crackS.
 1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
 2. Inspect for deterioration of supporting plaster and lath, and repair or replace deteriorated material as required for a sound substrate.
 3. Rake perimeter of hole to sound plaster, and slightly undercut existing plaster to enable replacement plaster to tuck behind existing plaster.
 4. Replace missing lath in kind. Bridge gaps in wood lath with expanded-metal lath, overlapping wood by 6 inches and fastening them together.
 5. Clean hole to remove loose materials and other foreign matter and deposits that could impair bond with repair material. Where grease, waxes, oils, waterborne staining, or other foreign matter and deposits that could impair bond with repair material have penetrated into the plaster, enlarge the hole to remove these deposits.
 6. Wet substrate to damp condition, but without visible water droplets, then install patch material to original profiles.
 7. Maintain adjacent plasterwork in an undamaged condition so far as practicable.
- B. Lime-Plaster Mix: 3 parts lime putty, 1 part gypsum neat plaster or gypsum gaging plaster for repairs under one foot in any dimension. For repairs greater than 12 inches in any dimension, 1 part lime putty, 2-1/2 parts sand, applied in two coats with fiber in first coat.
- C. Gypsum-Plaster Mix: Gypsum gaging plaster or Repair mix demonstrated in mockup.
- D. Finishing: Finish flat surfaces flush and with same texture as adjacent existing plaster. For molded plaster shapes, tool surface to restore the sharp edges and the shape of the molded shape to original contours.
- E. Hairline cracking within the plaster or plaster separation at edge of a patch is unacceptable. Completely remove such work and reinstall or repair.

3.9 CRACK REPAIR

- A. General: Repair discernible cracks in otherwise sound plaster, compensated on a Unit Price Basis.

1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
 2. Maintain adjacent plasterwork in an undamaged condition so far as practicable.
- B. Existing Topcoat: Open crack in existing topcoat to at least 1/8 inch in width and check for broken fiber reinforcement in base coats.
- C. Existing Base Coats: Do not open crack wider in existing base coats unless inspection or other indication shows that the fiber reinforcement has broken. Where inspections indicate failure of fiber reinforcement, Open crack to at least 1/8 inch in width and full depth with V-groove tool, and check for bond separation or lath deterioration.
- D. Clean out crack to remove loose materials and other foreign matter and deposits that could impair bond with repair material. Where grease, waxes, oils, waterborne staining, or other foreign matter and deposits that could impair bond with repair material have penetrated into the topcoat plaster, widen the crack and sand surface of the exposed basecoat to remove these deposits.
- E. Wet substrate with latex acrylic bonding agent to damp condition, but without visible water droplets.
- F. Install finish-coat plaster or repair material demonstrated in mockup to fill crack to original plaster profile.
- G. Finishing: Finish flat surfaces flush and with same texture as adjacent existing plaster. For molded plaster shapes, tool surface to restore the sharp edges and the shape of the molded shape to original contours.
- H. Offset Cracks: If the crack is offset in surface plane by more than 1/8 inch, cut the plaster on each side of the crack, a minimum width of 6 inches and down to the lath or other substrate. Then, repair as specified for flat-plaster removal and replacement.
- 3.10 REATTACHMENT OF DELAMINATED PLASTER (RDP)

- A. General: Reattach plaster that has detached from its wooden lath.
1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
 2. Maintain adjacent plasterwork in an undamaged condition so far as practicable.
- B. Reattachment of Delaminated Plaster in excess of the indicated scope will be compensated under the Unit Price schedule.
- C. Verify extent of detachment of plaster that has not yet fallen by tapping on plaster surface and evaluating the hollow or solid resonance.

- D. Protect floors from spillage and debris in the vicinity of work. Use materials resistant to the passage of fluids used in work.
- E. Drill 1/4-inch injection ports (holes) through the plaster spaced 3 to 6 inches apart over surface of detached plaster. Dislodge loose plaster particles, and vacuum debris from holes.
- F. Prewet injection ports, gaps at edges of lost plaster, back of plaster, and wooden lath with prewet solution.
- G. Inject adhesive into ports, enough to fill gaps between detached plaster and lath, and inject into gaps at edges of lost plaster.
- H. Clean off excess and smeared adhesive while wet.
- I. Apply temporary battens over surface of treated plaster to prevent further separation during repair work. Secure battens in place against plaster with screws through the battens and plaster and into the wood lath.
- J. Maintain temporary battens in place for a week or more, allowing adhesive to coalesce and dry.
- K. Remove battens, patch holes and missing plaster, and repair cracks.

3.11 INSTALLATION TOLERANCES

- A. Completed plaster installation shall not deviate from a true plane by more than 1/16 inch as measured by a 5-foot straightedge placed at any location on a surface, except where existing plaster is retained as a substrate for new plasterwork.

3.12 CLEANING AND PROTECTION

- A. Protect work of other trades against damage. Promptly remove plaster from surfaces not indicated to be repaired or plastered. Do not scratch or damage finished surfaces.
- B. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.
- C. Correct damage to other historic surfaces and to new work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. Remove temporary protection and enclosure of other work.

END OF SECTION 09 0320

SECTION 09 2900 – GYPSUM BOARD

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. Gypsum board for interior ceilings.
- 2. Joint treatment materials.
- 3. Trim accessories.
- 4. All other accessories for a complete installation work of specified under this Section.

- B. Related Sections:

- 1. Section 06 1000 - Rough Carpentry
- 2. Section 07 9200 - Joint Sealants
- 3. Section 09 9123 - Interior Painting

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Samples: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch long length for each trim accessory indicated.

- C. Samples for Initial Selection: For each type of trim accessory indicated.

- D. Samples for Verification: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch long length for each trim accessory indicated.

1.4 QUALITY ASSURANCE

- A. The following standards, as well as other standards which may be referred to in this Section, shall apply to the work of this Section:
 - 1. The Gypsum Construction Handbook, latest edition, USG.
 - 2. Construction Guide, latest edition, National Gypsum.
- B. Installer: Firm with not less than 5 years of successful experience in the installation of specified materials.
- C. Mockups: Build mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Build mockups for the following:
 - a. Each level of gypsum board finish indicated for use in exposed locations.
 - b. Each texture finish indicated.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

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.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Acceptable Manufacturers
 - 1. United States Gypsum Corporation
 - 2. Lafarge North America, Inc.
 - 3. National Gypsum Company
- B. Gypsum Board. Moisture/Mold-Resistant: ASTM C 1396/C 1396M.
 - 1. Core: 5/8 inch
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- C. Type X Gypsum Board. Moisture/Mold-Resistant: ASTM C 1396/C 1396M.
 - 1. Core: 5/8 inch
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- D. Gypsum Ceiling Board. Moisture/Mold-Resistant: ASTM C 1396/C 1396M.
 - 1. Core: 5/8 inch.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 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.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Mud-in End Caps.

1. Acceptable Manufacturer: Trim-Tex Inc
2. Performance Requirements:
 - a. Self-Extinguishing: Shall not continue to support combustion once flame source is removed.
 - b. Meet or exceed following ASTM Standards:
 - 1) ASTM E84-10 – Achieve Class A rating for Smoke and Flame Spread.
 - 2) ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard.
 - 3) GA-216-10 – Gypsum Association.
 - 4) Impervious to rust, galvanic corrosion, electrolysis and resistant to most chemicals.
 - c. Accessories:
 - 1) Trim-Tex 847 Drywall Spray Adhesive
 - 2) Trim-Tex Powdered Mud-Max adhesion additive
 - 3) 1/2" Divergent Staples

2.5 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.
 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Acoustical Sealant: Paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: One of the following:

- a. Tremco Inc; Hilti, Inc; Acoustical/Curtainwall Sealant
- b. USG Corporation; SHEETROCK Acoustical Sealant.
- c. Pecora Corporation; AC-20 FTR.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4-inch to 3/8-inch wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. 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.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Ceiling Type: Ceiling surfaces.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For 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.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.
 2. Bullnose Bead: Use Where indicated.
 3. LC-Bead: Use At exposed panel edges.
 4. L-Bead: Use Where indicated.
 5. U-Bead: Use Where indicated.
 6. Curved-Edge Cornerbead: Use at curved openings.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 1. Level 1: Ceiling plenum areas and concealed areas.

2. Level 5: At exposed areas.
 - a. Primer and its application to surfaces are specified in Section 09 9123 Interior Painting.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 2900

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.

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 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 THERMOPLASTIC-RUBBER BASE:

- A. Manufacturers: Subject to compliance with specified requirements, furnish products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Nora Systems, Inc.
 - 4. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
 - 1. Group: I solid, homogeneous.
 - 2. Style and Location:
 - a. Style B, Cove: Provide in areas with resilient flooring and as scheduled.
- C. Thickness: 0.125 inch.
- D. 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed

- G. Inside Corners: Preformed
- H. Colors: As selected by Architect from full range of industry colors.

2.2 RUBBER MOLDING ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, furnish products by one of the following:
 - 1. Johnsonite; A Tarkett Company.
 - 2. Roppe Corporation
 - 3. Nora Systems, Inc.
- B. Basis of Design:
 - 1. Rubber transition strip (RTS) for carpet to resilient flooring: Johnsonite Model CTA-XX-A.
- C. Locations: As scheduled
- D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 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 except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.

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. Concrete Substrates for Resilient: Prepare horizontal surfaces according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. 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.
- E. 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.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. 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 – VINYL COMPOSITION FLOOR TILING

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. Vinyl composition floor tile.
- 2. All adhesives and other accessories as required for a complete installation.

- B. RELATED SECTIONS

- 1. Section 03 3000 – Cast-In –Place Concrete

- C. WORK INSTALLED UNDER THIS SECTION BUT SPECIFIED ELSEWHERE

- 1. Section 09 6513 – Resilient Base and Accessories

1.3 REFERENCES

- A. ASTM International:

- 1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- 2. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- 3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- 4. ASTM F 1066 Standard Specification for Vinyl Composition Floor Tile
- 5. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- 6. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

- B. National Fire Protection Association (NFPA):

- 1. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - B. Submittals:
 - 1. Product Data: For adhesives, sealants and chemical-bonding compounds, documentation including printed statement of VOC content.
 - 2. Product Data: For adhesives and chemical-bonding compounds, documentation including printed statement of VOC content.
 - 3. Product Data For resilient tile flooring, documentation from an independent testing agency indicating compliance with the FloorScore standard.
 - C. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
 - D. Samples for Verification: Full-size units of each color and pattern of floor tile required.
 - E. Product Schedule: For floor tile use same designations indicated on Drawings.
 - F. Product Data: Submit manufacturer's product data sheets, installation guide, and maintenance guide for each material.
 - G. MSDS (Material Safety Data Sheets): for all adhesives used: membrane, primer, patch, leveler, heat weld cord, cold weld, liquid wax and cleaning agents.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.
- 1.7 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. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups for floor tile including resilient base and accessories.
 - a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color, and pattern in locations directed by Architect.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - C. Manufacturer's Qualifications: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of types equivalent to those specified. Manufacturers proposed for use, which are not named in this section, shall submit evidence of ability to meet performance requirements specified not less than 10 days prior to bid date.
 - 1. Color Matching: Provide resilient flooring products, including wall base and accessories, from one manufacturer to ensure color matching.
 - 2. Manufacturer capable of providing technical training and field service representation.
 - D. Installer Qualifications: Installer shall be manufacturer approved for the requirements of the project or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project.
 - E. Adherence to the Quality Management System approved by Lloyd's Register Quality Assurance to the Quality Management System Standard ISO 9001:2000.
 - F. Provide adhesives that are in compliance (0 grams/liter) with SCAQMD Rule 1168, < 60 grams/liter Standard for Rubber Floor Adhesives.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Store floor tile 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. Store floor tiles on flat surfaces.
 - B. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.
 - C. Deliver materials sufficiently in advance of installation to condition materials to the required temperature prior to installation
- 1.10 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 floor tile during the following time periods:

1. 48 hours before installation.
 2. During installation.
 3. 72 hours after installation.
- B. Maintain humidity, within temperature range, at 50% RH +/- 10% in areas to receive resilient flooring.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F.
- D. 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.
- E. Close spaces to traffic during floor tile installation.
- F. Close spaces to traffic for 48 hours after floor tile installation.
- G. Install floor tile after other finishing operations, including painting, have been completed.

1.11 WARRANTY

- A. Provide manufacturer's standard one-year warranty against defects in manufacturing and workmanship of all flooring products. Provide manufacturer's warranty as specified under each product as applicable, including limited wear, defect and conductivity

1.12 EXTRA MATERIALS

- A. Furnish full size units equal to 2 percent of quantity of resilient flooring installed as extra materials. Properly label and package extra materials. Deliver to owners designated storage area

PART 2 - PRODUCTS

2.1 BASIS-OF-DESIGN PRODUCTS

- A. The design for each resilient tile flooring type is based on the product named, Specification and Drawings to establish the quality level and design requirements for the project. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.
- B. Substitution of comparable products and materials specified shall be in accordance to the 'Proposed Substitution' procedures.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. FloorScore Compliance: Resilient tile flooring shall comply with requirements of FloorScore certification.
- C. Low-Emitting Materials: Flooring system 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."

2.3 VINYL COMPOSITION FLOOR TILE

- A. Products: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Congoleum Corporation.
 - 3. Mannington Mills, Inc.
- B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch.
- E. Size: 12 by 12 inches.
- F. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.4 RESILIENT TILE FLOORING SCHEDULE

- A. Resilient Tile Flooring Schedule: Selection of resilient tile flooring products, colors, surface textures, patterns, and other appearance characteristics, are indicated in the following schedules.
 - 1. Products: Resilient tile flooring products are identified in the 'Finish Schedule'.
 - 2. Locations: Resilient tile flooring location are located in the 'Finish Schedule'.

2.5 INSTALLATION MATERIALS

- A. Use only manufacturer's approved system products as specified in their installation guidelines.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement

based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

- C. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
 - 1. Adhesives shall comply with the following limits for VOC content:
 - a. Vinyl Composition Tile Adhesives: 50 g/L or less.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer. All floors are intended to be no wax or polish floors. Review the specific Manufacturer's maintenance requirements with the Owner prior to any finish being applied to flooring products.

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 floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. A building or flooring area that is water tight and fully enclosed from the elements, including roof, windows or facades and doors, that is ready for the flooring installation is required.
- C. A concrete substrate that shall be structurally sound, that is finished shrinking, cracking, curling or moving in any way is required
- D. For all concrete substrates on or below grade, provide a permanent effective vapor retarder with a low permeance (less than 0.1) having a minimum thickness of 10 mils, or meets the requirements of the latest edition of ASTM E1745 (Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs) shall be placed directly underneath the concrete above the granular fill, and shall be installed as per the manufacturer's written instructions. A letter shall be provided to the end user confirming the correct products have been used and that it is fully warranted.

- E. Provide a secure storage area that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48 hours prior to and during the application of the flooring, so the flooring contractor can acclimate the flooring materials is required.
- F. Areas of the flooring that are subject to direct sunlight through doors or windows shall have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72 hours after the installation to allow the adhesive to cure. Note these areas shall be installed using wet adhesives only.
- G. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- H. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- I. Do not install floor tiles 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 floor tile and installation materials into spaces where they will be installed.
- J. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.

1. Prevent all traffic for a minimum of 12 hours and heavy rolling loads for 72 hours to allow the adhesive to set up. If required, after 12 hours protect the flooring from damage during construction operations using Masonite, plywood or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.
 2. Clean the flooring within 72 hours after the installation. Clean the flooring only using the method detailed in the manufacturer's Maintenance Guide.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles square with room axis in pattern indicated.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles with grain running in one direction and in pattern of colors and sizes indicated.
 2. Basket-weave pattern is not acceptable.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Finish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying floor finish.
1. Apply products as recommended by the flooring manufacturer after discussing all maintenance options with the Owner. All floors are specified to be no wax/ no polish and therefore specific requirements for topical treatments vary.
- E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.
- F. Sealers and Finish Coats: Remove soil, visible adhesive, and surface blemishes from resilient terrazzo floor tile surfaces before applying liquid cleaners, sealers, and finish products.
1. Sealer: Apply two base coats of liquid sealer.
 2. Finish: Apply three coats of liquid floor finish.
- G. Cover floor tile until Substantial Completion.

END OF SECTION 09 6519

SECTION 09 9113 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Steel and iron.
 - 2. Galvanized metal.
 - 3. Wood.
- B. Related Requirements:
 - 1. Section 05 5213 – Pipe and Tube Railing

1.3 DEFINITIONS

- A. MPI Gloss Level 1 (Flat): Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5 (Semi-gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches square.
 2. Apply coats on Samples in steps to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 40 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 40 and 90 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore & Co.; Products as designated in "Exterior Painting Schedule" or comparable products by one of the following:
 - 1. Behr Process Corporation.
 - 2. PPG Architectural Coatings.
 - 3. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 50 g/L.

3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 150 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 500 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Shellacs, Clear: 730 g/L.
9. Shellacs, Pigmented: 550 g/L.

D. Colors: As selected by Architect from manufacturer's full range or as indicated in a color schedule.

1. Ten percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Fiber-Cement Board: 12 percent.
 2. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- F. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Paint entire exposed surface of window frames and sashes.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates - Ferrous Metal:

- 1. Water-Based Light Industrial Coating System [MPI EXT 5.1C] [MPI EXT 5.1M]:
 - a. Prime Coat: Primer, alkyd, anti-corrosive for metal, MPI #79.
 - 1) Benjamin Moore® Super Spec HP® Alkyd Metal Primer P06 (326 g/L), MPI #79.
 - 2) Shop primer in Section where substrate is specified.
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Gloss Level 6), MPI #164.
 - 1) Benjamin Moore® Ultra Spec® HP D.T.M. (Direct-To-Metal) Acrylic Gloss Enamel HP28 (142 g/L), MPI #114, MPI #154, MPI #164.

B. Galvanized-Metal Substrates:

- 1. Water-Based Light Industrial Coating System MPI EXT 5.3J:
 - a. Prime Coat: Primer, galvanized, water based, MPI #134.
 - 1) Benjamin Moore® Ultra Spec® HP Acrylic Metal Primer HP04 (48 g/L).
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Gloss Level 6), MPI #164.
 - 1) Benjamin Moore® Ultra Spec® HP D.T.M. (Direct-To-Metal) Acrylic Gloss Enamel HP28 (142 g/L), MPI #114, MPI #154, MPI #164.

C. Wood Substrates: Wood trim, Doors and Windows.

1. Latex over Latex Primer System [MPI EXT 6.3L]:
 - a. Prime Coat: Primer, latex for exterior wood, MPI #6.
 - 1) Benjamin Moore® Ultra Spec® EXT Primer N558 (45 g/L), MPI #6.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.
 - 1) Benjamin Moore® Ultra Spec® EXT Gloss Finish N449 (46 g/L), MPI #11.
2. Latex System [MPI EXT 6.3A]:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - 1) Benjamin Moore® Super Spec® Exterior Alkyd Primer 176 (345 g/L), MPI #5.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.
 - 1) Benjamin Moore® Ultra Spec® EXT Gloss Finish N449 (46 g/L), MPI #11.

D. Wood Substrates: Wood Board Siding.

1. Latex System [MPI EXT 6.3A]:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - 1) Benjamin Moore® Super Spec® Exterior Alkyd Primer 176 (345 g/L), MPI #5.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15.
 - 1) Benjamin Moore® Ultra Spec® EXT Satin Finish N448 (46 g/L), MPI #15.

E. Wood Substrates: Wood-based panel products.

1. Latex over Alkyd Primer System [MPI EXT 6.4G]:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - 1) Benjamin Moore® Super Spec® Exterior Alkyd Primer 176 (345 g/L), MPI #5.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

- 1) Benjamin Moore® Ultra Spec® EXT Gloss Finish N449 (46 g/L),
MPI #11.

END OF SECTION 09 9113

SECTION 09 9123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on interior the following interior substrates:
 - 1. Concrete masonry units (CMUs).
 - 2. Steel and iron.
 - 3. Wood.
 - 4. Gypsum board.
- B. Related Requirements:
 - 1. Section 09 2900 - Gypsum Board

1.3 DEFINITIONS

- A. MPI Gloss Level 1 (Matte): Not more than five units at 60 degrees and 10 units at 85 degrees, in accordance with ASTM D523.
- B. MPI Gloss Level 2 (Flat): Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, in accordance with ASTM D523.
- C. MPI Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, in accordance with ASTM D523.
- D. MPI Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, in accordance with ASTM D523.
- E. MPI Gloss Level 5 (Semi-gloss): 35 to 70 units at 60 degrees, in accordance with ASTM D523.
- F. MPI Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, in accordance with ASTM D523.
- G. MPI Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, in accordance with ASTM D523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Sustainable Design Submittals:
 - 1. Product Data: For paints and coatings, indicating VOC content.
 - 2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.
- C. Samples for Initial Selection: For each type of topcoat product.
- D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore & Co.; Products as designated in Interior Painting Schedule or comparable products by one of the following:
 1. Behr Process Corporation.
 2. Glidden Professional.
 3. PPG Architectural Coatings.
 4. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Flat Paints and Coatings: 50 g/L.
 2. Nonflat Paints and Coatings: 50 g/L.
 3. Dry-Fog Coatings: 150 g/L.
 4. Primers, Sealers, and Undercoaters: 100 g/L.
 5. Rust-Preventive Coatings: 100 g/L.
 6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
 7. Pretreatment Wash Primers: 420 g/L.
 8. Shellacs, Clear: 730 g/L.
 9. Shellacs, Pigmented: 550 g/L.
- D. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings 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."
- E. Colors: [As selected by Architect from manufacturer's full range or as scheduled on the Contract Drawings.
1. Ten percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Masonry (Clay and CMUs): 12 percent.
 - 2. Wood: 15 percent.
 - 3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints in accordance with manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedule may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in equipment rooms:
 - a. Uninsulated metal piping.
 - b. Pipe hangers and supports.
 - c. Metal conduit.
 2. Paint the following work where exposed in occupied spaces:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written instructions, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. CMU Substrates:

1. Latex System [MPI INT 4.2A]:

- a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
 - 1) Benjamin Moore® Ultra Spec® Hi-Build Masonry Block Filler 571 (45 g/L), MPI #4; LEED v4; qualifies for CHPS.
- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior (MPI Gloss Level 3), MPI #52 and MPI #52 X-Green™.
 - 1) Benjamin Moore® Super Hide® Zero-VOC Interior Eggshell 357 (0 g/L), MPI #52, MPI #52 X-Green™; LEED v4; qualifies for CHPS.

B. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System [MPI INT 5.1S]:

- a. Prime Coat: Primer, rust inhibitive, water based, MPI #107 and MPI #107 X-Green™].
 - 1) Benjamin Moore® Ultra Spec® HP Acrylic Metal Primer HP04 (48 g/L), MPI #107, MPI #107 X-Green™, MPI #134; LEED v4; qualifies for CHPS.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 4), MPI #146 and MPI #146 X-Green™.
 - 1) Benjamin Moore® Ultra Spec® 500 Interior Semi-Gloss N539 (0 g/L), MPI #43, MPI #43 X-Green™, MPI #140, MPI #140 X-Green™, MPI #146, MPI #146 X-Green™; LEED v4; qualifies for CHPS.

C. Galvanized-Metal Substrates:

1. Latex System [MPI INT 5.3J]:

- a. Prime Coat: Primer, galvanized, water based, MPI #134 and MPI #107 X-Green™.
 - 1) Benjamin Moore® Ultra Spec® HP Acrylic Metal Primer HP04-78 (48 g/L), MPI #134; LEED v4; qualifies for CHPS.
- b. Intermediate Coat: Latex, interior, matching topcoat.

- c. Topcoat: Latex, interior (MPI Gloss Level 4), MPI #43 and MPI #43 X-Green™.
- 1) Benjamin Moore® Aura® Waterborne Interior Satin Finish 526 (0 g/L), MPI #43, MPI #43 X-Green™, MPI #140, MPI #140 X-Green™; LEED v4; qualifies for CHPS.
 - 2) Benjamin Moore® Regal® Select Waterborne Interior Pearl Finish 550 (0 g/L), MPI #43, MPI #43 X-Green™, MPI #140, MPI #140 X-Green™; LEED v4; qualifies for CHPS.
 - 3) Benjamin Moore® Waterborne Satin Impervo® 100% Acrylic Low Lustre Enamel N314 (137 g/L), MPI #43.
 - 4) Benjamin Moore® Ultra Spec® 500 Interior Semi-Gloss N539 (0 g/L), MPI #43, MPI #43 X-Green™, MPI #140, MPI #140 X-Green™, MPI #146, MPI #146 X-Green™; LEED v4; qualifies for CHPS.
 - 5) Benjamin Moore® Super Hide® Zero VOC Interior Semi-Gloss 358 (0 g/L), MPI #43, MPI #43 X-Green™; LEED v4.

D. Wood Substrates: Wood trim, architectural woodwork, doors and windows.

1. Latex over Latex Primer System [MPI INT 6.3T]:
 - a. Prime Coat: Primer, latex, for interior wood, MPI #39.
 - 1) Benjamin Moore® Sure Seal™ Latex Primer Sealer 027 (48 g/L), MPI #6, MPI #39, MPI #137; LEED v4; qualifies for CHPS.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54 and MPI #54 X-Green™.
 - 1) Benjamin Moore® Ultra Spec® 500 Interior Gloss Finish N540 (0 g/L), MPI #54, MPI #54 X-Green™, MPI #141, MPI #141 X-Green™, MPI #147, MPI #147 X-Green™; LEED v4; qualifies for CHPS.

E. Gypsum Board Substrates: Walls:

1. Latex over Latex Sealer System [MPI INT 9.2A]:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50 and MPI #50 X-Green™.
 - 1) Benjamin Moore® Fresh Start® Natura® Zero-VOC Primer 511 (0 g/L), MPI #50, MPI #50 X-Green™, MPI #149, MPI #149 X-Green™; qualifies for CHPS.
 - b. Prime Coat: Latex, interior, matching topcoat.
 - c. Intermediate Coat: Latex, interior, matching topcoat.
 - d. Topcoat: Latex, interior, flat (MPI Gloss Level 1), MPI #53 and MPI #53 X-Green™.
 - 1) Benjamin Moore® Super Hide® Zero-VOC Interior Flat 355 (0 g/L), MPI #53, MPI #53 X-Green™; LEED v4; qualifies for CHPS.

- e. Topcoat: Latex, interior (MPI Gloss Level 3), MPI #52 and MPI #52 X-Green™.
 - 1) Benjamin Moore® Super Hide® Zero-VOC Interior Eggshell 357 (0 g/L), MPI #52, MPI #52 X-Green™; LEED v4; qualifies for CHPS.

- F. Gypsum Board Substrates: Ceilings and Soffits:
 - 1. Latex over Latex Sealer System [MPI INT 9.2A]:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50 and MPI #50 X-Green™.
 - 1) Benjamin Moore® Fresh Start® Natura® Zero-VOC Primer 511 (0 g/L), MPI #50, MPI #50 X-Green™, MPI #149, MPI #149 X-Green™; qualifies for CHPS.
 - b. Prime Coat: Latex, interior, matching topcoat.
 - c. Intermediate Coat: Latex, interior, matching topcoat.
 - d. Topcoat: Latex, interior, flat (MPI Gloss Level 1), MPI #53 and MPI #53 X-Green™.
 - 1) Benjamin Moore® Super Hide® Zero-VOC Interior Flat 355 (0 g/L), MPI #53, MPI #53 X-Green™; LEED v4; qualifies for CHPS.

END OF SECTION 099123

SECTION 31 1750 – EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK:

- A. Provide all means necessary to install, inspect and maintain, and remove temporary erosion and sediment control measures as required to minimize the erosion and unspecified transport of soil and sediment from the site. THE CONTRACTOR SHALL MINIMIZE SITE DISTURBANCE.

1.3 QUALITY ASSURANCE:

A. General

1. Install and maintain all soil erosion and sediment control measures in compliance the Stormwater Permit conditions.
2. Contractor shall implement all measures required prior to the start of any other activities on site.
3. Grade and maintain site at all times such that all storm water runoff from disturbed areas is diverted to soil erosion and sedimentation control facilities.
4. No soil, not protected by erosion and sedimentation control measures, can be disturbed at any time.
5. The Contractor shall comply with applicable Federal, State, and local regulations relating to the prevention and abatement of pollution.
6. The Contractor shall be responsible for maintaining all erosion and sediment control devices and shall be required to provide measures to immediately correct problems encountered in the field whether or not the measures are shown on the plan. Measures that include the installation of erosion control blankets or reducing the amount of exposed soil may be necessary.

- B. Product Data: Submit manufacturer's catalogue cuts, specifications and installation instructions for silt fences, filter fabrics and erosion control blankets.

- C. Product Stockpiling: Stockpiles of stabilization measures such as haybales, silt fence, 1½-inch gravel for check dams, filter fabric, and mulch shall be maintained at the site for use in stabilizing disturbed areas in advance of severe weather conditions.

PART 2 - PRODUCTS

- 2.1 INLET PROTECTION: Filtrex inlet protection or approved equal.
- 2.2 DEWATERING PITs: Number and location to be determined by contractor.
- 2.3 SILT FENCE: Silt fence fabric shall be Mirafi 100X or equal. Wood posts shall be of sound quality hardwood, a minimum 36-inches long and 2-inches square. Metal posts shall be standard T and U section weighing not less than one pound per linear foot. Wire fence backing shall be a minimum 14½ gage with a maximum 6-inch mesh opening and securely attached to fence posts. Posts shall extend a minimum of 16-inches into the ground.
- 2.4 HAY BALE BARRIERS: Wood posts shall be of sound quality hardwood, a minimum 36-inches long. Metal posts shall be standard T and U section weighing not less than one pound per linear foot.
- 2.5 FILTER FABRIC: Filter fabric shall be Mirafi 600x.
- 2.6 TEMPORARY STABILIZATION
- A. Establishment of Temporary Grass Cover: Prepare seed bed, scarify if compacted, remove debris and obstacles such as rocks and stumps, and seed within 24 hours. Amend soil, lime soil to pH of 6.0 and fertilize at a rate of 14 pounds per 1,000 square feet with a 5-10-10 or equivalent fertilizer. Work amendments a minimum of 4-inches into soil. If seeding in October/November, seed shall be Certified Aroostook winter rye at 100 pounds per acre, otherwise seed shall be ryegrass (annual or perennial) at 30 pounds per acre.
- B. Mulch/RECP: Small grain straw mulch or Type 1 erosion control blankets as specified on drawing SP-5.1. Straw mulch shall be applied at a rate of two tons (100 to 120 bales) per acre. Erosion control blankets shall be BonTerra S2 installed as recommended by manufacturer.
- C. Install Temporary Stabilization within 24-hours after the end of construction activities in an area unless there is snow cover or construction activities will resume within seven days.
- D. Tackifier: When covering between October and April, cover exposed soils with hydroseed and tackifier with the following application rates:
- | | |
|---|------------|
| 1. Slopes less than 3 Vert.:12 Horiz. | 75 lbs/ac |
| 2. Slopes between 3 Vert.:1 Horiz. and 2 Vert.:1 Horiz. | 100 lbs/ac |
| 3. Slopes greater than 2 Vert.:1 Horiz. | 150 lbs/ac |
- Acceptable product: Conwed Fibers Con-Tack AT Tackifier as manufactured by Profile Products, LLC (800) 366-1180

PART 3 - EXECUTION

- 3.1 GENERAL: Install and remove measures as required. The measures shall be maintained until permanent protection of the contributing watershed is approved by the Owner's Representative. All storm drainage outlets that have been silted due to the work will be cleaned, as required.

- 3.2 INSPECTIONS: Inspect and report measures daily and within 24-hours of the end of a rainfall event. All inspections are to be made by a NYS trained and certified contractor. Stabilized areas will be inspected monthly until the entire site is stabilized.
- 3.3 MAINTENANCE: Maintenance and deficiencies shall be completed within two calendar days of determining its need.
- 3.4 PAVEMENT: Provide temporary pavement when adjacent to traffic lanes and when directed by the Engineer.

END OF SECTION 31 1750

SECTION 31 2000 – EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Rockefeller Archive Center General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Related sections include but are not limited to:
 - 1. Section 31 1750 Erosion and Sediment Control
- C. Any conflict in requirements between the Drawings, Specifications, Geotechnical Report, or other design documents should be interpreted in favor of the most restrictive requirement unless otherwise directed by the Engineer.

1.2 SUMMARY

- A. Section Includes:
 - 1. Definition of excavation, fill and backfill materials.
 - 2. The preparation and dewatering requirements for open excavations and/or structures.
 - 3. General excavation requirements.
 - 4. Excavation requirements for buildings and structures.
 - 5. Excavation requirements for preparing subgrades for walks and pavements.
 - 6. Excavation requirements for utility trenches.
 - 7. Excavation of landscaped areas.
 - 8. Subgrade inspection requirements.
 - 9. General backfill requirements.
 - 10. Backfill requirements for utility trenches.
 - 11. Fill material requirements.
 - 12. Soil moisture control requirements.
 - 13. Compaction requirements of backfills and fill material.
 - 14. Bedding course placement under slabs-on-grade, walks and other structures.
 - 15. Subbase course placement under asphaltic concrete pavements.
 - 16. Drainage course for porous pavement and underdrain systems.
 - 17. Subsurface drainage.
 - 18. Field quality control of subgrade preparation, material backfill and compaction testing.
 - 19. Protection of excavated and graded areas.
 - 20. Storage of soil materials.
 - 21. Unauthorized excavation.
 - 22. Removal of excess and unsuitable material from the site.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beneath, beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench to the top of the proposed subgrade as shown and detailed on the plans.
- B. Structural Fill: Fill material placed under structures after removal of unsuitable bearing materials. Material shall be 3/4-inch, clean aggregate or other material as approved by the project's geotechnical engineer.
- C. Subbase Course: Aggregate layer placed between the existing subgrade and hot-mix asphalt paving.
- D. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe and in other open excavated areas to support new curbing, walks, concrete stairs, slabs-on-grade, manholes or other structures. The bedding material shall also be used to backfill trenches to the depths and/or limits detailed on the plans. Sand bedding material shall be used in place of the aggregate material specified where required by either the local utility, Owner's representative or Project Engineer.
- E. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill, or soil from on-site sources meeting the specifications for fill material and determined suitable for on-site use.
- F. Drainage Course: Aggregate layer supporting the collection and transporting of water.
- G. Earth Excavation: Defined to include removal, and if required proper disposal off-site, of the following:
1. Soil and all other materials encountered of any name and nature that are not classified as rock excavation or unauthorized excavation.
 2. Hardpan, loose or decomposed bedrock or other such material that may require intermittent drilling and wedging to increase production or facilitate handling of the material with equipment normally used in the particular excavation operation.
- H. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as shown on the contract drawings. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
- I. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
- J. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner, Construction Manager, or Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation. Remedial work may include, but not be limited to, replacement of the unauthorized excavation by backfilling and compacting as specified for authorized excavations of the same classification, unless otherwise directed by the Owner's Representatives.
- K. Fill: Soil materials used to raise existing grades.
- L. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard for bulk excavation or 3/4 cubic yard for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without

systematic drilling, ram hammering, ripping, or blasting, when permitted.

- 1) Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
 - 2) Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.
- M. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586
- N. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, inlets, catch basins, manholes, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- O. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below the subbase or bedding course, drainage or reservoir course, or topsoil materials.
- P. Recycled Material: The use of recycled material from any off-site source will not be permitted.
- Q. Utilities: On-site underground pipes, conduits, ducts, tunnels, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
 2. Controlled Low Strength Material (CLSM).
 3. Warning tapes.
 4. Imported borrow fill and aggregate
- B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: 12-inches by 12-inches.
 2. Warning Tape: 12-inches long; of each color.
 3. Earthwork, borrow fill, aggregate materials; 5-gallon pail containing a representative sample plus a sealed quart plastic bag containing a representative moisture sample of material passing the No. 4 sieve.
- C. Qualification Data: For qualified testing agency.
- D. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.

2. Laboratory compaction curve according to ASTM D 1557.

- E. Pre-Excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

- B. Utility Locator Service: Notify "Call Before You Dig" for area where Project is located before beginning earth moving operations.

- C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.

- D. Do not commence earth moving operations until plant-protection measures are in place.

- E. Do not commence earth moving operations until all subsurface utilities have been located and marked in the field.

- F. The following practices are prohibited within areas not identified as work zones shown on the approved Construction Plan:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Erection of sheds or structures.
4. Impoundment of water.
5. Excavation or other digging unless otherwise indicated.
6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

- G. Subsurface Information:

1. The Owner makes no predictions or representations regarding the character or extent of soil, rock or other subsurface condition to be encountered during the work. The Contractor shall make his own deductions on the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those as calculated and/or anticipated by him. Borings and other exploratory operations may be

performed by the Contractor, at the Contractor's option and following the Owner's approval. No change in the Contract Sum will be authorized for such additional exploration undertaken by the Contractor.

2. The Contractor shall make his own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations resulting from the subsurface conditions.
3. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the confirmation of the ground, the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; the general and local conditions, water levels and all other matters which can in any way affect the work.
4. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of adjoining properties and the proposed sequence of construction.
5. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all New York State and Federal regulations in regard to the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, and SP according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3-inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups SM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
 2. Unsatisfactory materials also include materials below structures and/or foundations determined by the Owner's Representatives to be unsatisfactory bearing materials.
- D. Subbase Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; NYSDOT Type 1. The use of recycled material from any off-site source will not be permitted and recycled material from onsite demolition may not be used without written authorization from the owner.

- E. Structural Fill: Naturally or artificially, well graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1½ -inch sieve and not more than 12 percent passing a No. 200 sieve. This material must be approved by the Owner's Representatives.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel or crushed stone; ASTM D 2940; except with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 8 sieve.
- G. Trap Rock: Narrowly graded mixture of washed crushed stone ASTM D 448; coarse-aggregate grading Size 1; with 100 percent passing a 4-inch sieve and 0 to 15 percent passing a 1½-inch sieve.
- H. Sand: ASTM C 33; fine aggregate.
- I. Topsoil and other Planting Media: See Division 32 Section 329000 Planting Media Preparation and Placement.
- J. CLSM high slump mixture of Portland cement, fly ash and fine aggregate formulated, licensed and marked K-Krete or equal.
 - 1. Provide mixture with a 28 day compressive strength of 200 psi with no measureable shrinkage or surface settlement.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Filter fabric, manufactured for subsurface drainage applications, should meet the following minimum requirements as described in the "Subsurface Investigation and Analysis Report":
 - 1. Minimum Permittivity (ASTM D4991) = 0.2 sec
 - 2. Maximum AOS (ASTM D4751) = 0.25 mm
- B. Acceptable Products:
 - 1. Mirafi 140N by Mirafi, Inc. or approved equal.

2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6-inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30-inches deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXCAVATION, GENERAL

- A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by the Owner's Representatives. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
 - a. Intermittent drilling; if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
 - 2. Rock excavation includes removal and disposal of rock if material cannot be reused on-site or found to be surplus excavated material. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 12-inches outside of minimum required dimensions of concrete cast against grade.
 - b. 12-inches beneath bottom of concrete slabs-on-grade.
 - c. 12-inches beneath pipe in trenches, and the greater of 24-inches wider than pipe or 30-inches wide.

3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1-inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavation for Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1-inch. Do not disturb bottom of excavations intended as bearing surfaces.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
 - 1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12-inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: 12-inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches 6-inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

3.7 EXCAVATION OF AREAS TO BE LANDSCAPED

- A. Excavate existing soil to the depths required to prepare the subgrade to receive topsoil, amended soil, drainage course material or other material as detailed on the plans. Loosen subgrade using rototillers to a minimum depth of 6-inches. Remove all stones larger than 1-inch in any dimension and all sticks, roots, rubbish, and other extraneous matter within the planted areas and legally dispose of them off the Owner's property.
- B. If underground utilities, rock or groundwater conditions are encountered at an elevation at or above the elevation of the required subgrade the Contractor shall notify the owner's representative immediately.

3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, sub-drainage.

2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Place and compact initial backfill of satisfactory soil, free of particles larger than 1-inch in any dimension, to a height of 12-inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Place and compact final backfill of satisfactory soil or Control Density Backfill Material to final subgrade elevation.

F. Install warning tape directly above utilities, 12-inches below finished grade, except 6-inches below subgrade under pavements and slabs.

3.10 FILL MATERIAL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, gravel material.
3. Under steps and ramps, use structural fill.
4. Under building slabs, use structural fill.

C. Place fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material

that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF BACKFILLS AND FILL MATERIAL

- A. Place backfill and fill materials in layers not more than 12-inches in loose depth for material compacted by heavy compaction equipment, and not more than 4-inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, steps, and pavements, scarify and re-compact top 12-inches of existing subgrade and each layer of backfill or fill material at 95 percent.
 - 2. Under walkways, scarify and re-compact top 6-inches below subgrade and compact each layer of backfill or fill material at 95 percent.
 - 3. Under turf or unpaved areas, scarify and re-compact top 6-inches below subgrade and compact each layer of backfill or fill material at 90 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material.

3.13 SUBBASE COURSE UNDER ASPHALTIC CONCRETE PAVEMENTS

- A. Place subbase course on existing and/or compacted subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course under pavements as follows:
 - 1. Place subbase course material over subgrade and under hot-mix asphalt pavement.
 - 2. Shape subbase course to required crown elevations and cross-slope grades.
 - 3. Place subbase course 12-inches or less in compacted thickness in a single layer.
 - 4. Place subbase course that exceeds 12-inches in compacted thickness in layers of equal thickness, with no compacted layer more than 12-inches thick or less than 3-inches thick.
 - 5. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.14 BEDDING COURSE UNDER SLABS-ON-GRADE, WALKS AND MISC. STRUCTURES

- A. Place bedding course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact bedding course under slabs-on-grade, walks and other structures as follows:
 - 1. Place bedding course 12-inches or less in compacted thickness in a single layer.
 - 2. Place bedding course that exceeds 12-inches in compacted thickness in layers of equal thickness, with no compacted layer more than 12-inches thick or less than 3-inches thick.

3. Compact each layer of bedding course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile, drainage course filter material and sub-drainage pipe in accordance with the details shown on the plans.
 1. Surround drain pipe with 6-inches minimum drainage course material (as specified herein) or as detailed on plans.

3.16 FIELD QUALITY CONTROL

- A. Soil Material Testing: A representative sample as required by the owner's representatives from a truck load of imported material shall be tested for conformance to the specifications.
- B. Imported Material that does not meet the specified gradation shall be removed from the site and replaced with conforming material.

3.17 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 1. Turf Areas, Planting Areas or other Unpaved Areas: Plus or minus 1-inch of the proposed top of subgrade elevation to receive topsoil, planting and/or amended soil mix, drainage course material or other material to the depths detailed on the plans.
 2. Concrete Pavements, Walks and other structures: Less than 1/2 inch of the proposed bottom of the bedding course as detailed on the plans.
 3. Asphalt Pavements: Less than 1/2 inch of the proposed bottom of the subbase course as detailed on the plans.

3.18 PROTECTION OF THE WORK AREAS

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 1. Scarify or remove and replace soil material to depth as directed by Owners Representative; reshape and re-compact.

- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 STORAGE OF SOIL MATERIALS

- A. Stockpile borrows soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.20 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Owner's Representatives.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by the Owner's Representative.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Unless directed otherwise, transport surplus satisfactory and unsatisfactory soil off Owner's property.
 - 1. Remove waste materials, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 2000

SECTION 31 5000 – EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Rockefeller Archive Center General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Division 01 Section Temporary Facilities and Controls – for temporary utilities and support facilities.
 - 2. Division 31 Section Dewatering – for dewatering system for excavations.

1.2 SUMMARY

- A. Section includes temporary excavation support and protection systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
 - 4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

- A. Shop Drawings: For excavation support and protection system.
- B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

- A. Pre-Installation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:

- a. Existing utilities and subsurface conditions.
- b. Proposed excavations.
- c. Proposed equipment.
- d. Monitoring of excavation support and protection system.
- e. Working area location and stability.
- f. Abandonment or removal of excavation support and protection system.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 1. Notify Construction Manager and Owner no fewer than three (3) days in advance of proposed interruption of utility.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 3 inches.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of

movement to ensure that excavation support and protection systems remain stable.

- C. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches.
- B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

3.3 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
 - 2. Fill voids immediately with approved backfill compacted to density specified in Section 31 2000 Earthwork.
 - 3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Leave excavation support and protection systems permanently in place.

END OF SECTION 31 5000

SECTION 32 1216 – ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 STREETS AND SIDEWALKS:

A. General Requirements

- 1. The Contractor shall furnish, place, construct and incorporate into the work, parking and driveway pavements where indicated on the plans in accordance with the Town of Mount Pleasant requirements.
- 2. The Contractor is further directed to the Construction Details shown on the contract drawings.

1.3 DESCRIPTION OF WORK:

A. General

- 1. Extent of asphalt concrete paving work is shown on the drawings including parking areas, driveways and temporary and permanent pavement replacement in areas where existing street pavements have been removed due to trenching operations.
- 2. Prepared subbase is specified in Section 31 2000 Earthwork.

B. Aggregate Subbase

- 1. Where applicable, is specified in Section 31 2000 Earthwork.

C. Material Certificates

- 1. Provide copies of material certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.

D. Codes and Standards

- 1. Comply with New York State Department of Transportation standard specifications, latest edition and with the Westchester County Departments of Public Works and Transportation governing regulations.

E. Weather Limitations

- 1. Apply prime and tack coats when ambient temperature is above 50°F and when temperature has not been below 35°F for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- 2. Construct asphalt concrete surface course when atmospheric temperature is above 40°F and only after base course and binder course have been exposed to one

winter season. Base course may be placed when air temperature is above 30°F and rising.

- F. Grade Control
 - 1. Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. General
 - 1. Use locally available materials and gradations as required by the Town of Mount Pleasant Department of Public Works which exhibit a satisfactory record of previous installations.
- B. Base Course Aggregate
 - 1. Sound, angular, granular stone as specified on the plans.
- C. Asphalt Concrete
 - 1. As specified on the plans.
- D. Tack Coat
 - 1. Emulsified asphalt; AASHTO M 140 (ASTM D 997) or M 208 (D 2397); SS-1h or CSS-1h, diluted with one part water to one-part emulsified asphalt.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION:

- A. Remove loose material from compacted subbase surface.
 - 1. Proof roll prepared subbase with a ten-ton roller to check for unstable areas and areas requiring additional compaction.
 - 2. Notify Owner's Representative of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- B. Tack Coat
 - 1. Apply to contact surfaces of previously constructed asphalt concrete binder course and surfaces abutting or projecting into existing asphalt concrete pavement. Distribute at rate of 0.10 gallons per square yard of surface.
 - 2. Allow to dry until at proper condition to receive paving.
 - 3. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

3.2 PLACING PAVEMENT MIX:

A. General

1. Place asphalt concrete mix on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225°F. Place inaccessible and small areas by hand. Place each course to required grade, cross-section and compacted thickness.

B. Paver Placing

Place in strips not less than 10 feet wide, unless otherwise acceptable to Owner's Representative. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course and binder course for a section before placing surface course. Base course and binder course shall be exposed one winter season before applying surface course.

C. Joints

1. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

3.3 ROLLING:

A. General

1. Begin rolling with a ten-ton roller when mixture will bear roller weight without excessive displacement.
2. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

B. Breakdown Rolling

1. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.

C. Second Rolling

1. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

D. Finish Rolling

1. Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

E. Patching

1. Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.

F. Protection

1. After final rolling, do not permit vehicular traffic on pavement until mixture has cooled enough not to become marked. Erect barricades to protect paving from traffic.

3.4 FIELD QUALITY CONTROL:

A. General

1. Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by the Owner's Representative.

B. Thickness

1. In-place compacted nominal pavement thickness will not be acceptable if exceeding following allowable variation from required thickness:

Base Course:	1/4"
Binder Course:	1/4"
Surface Course:	1/4"

2. The sum total thickness of all the courses shall not vary from the total nominal thickness indicated on the plans by more than 1/2 inch.

C. Surface Smoothness

1. Test unfinished surface of each asphalt concrete course for smoothness, using 10 foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:

Base Course Surface:	1/4"
Wearing Course Surface:	1/8"

D. Crowned Surfaces

1. Test with crowned template centered and at right angle to crown. Maximum allowable variance from template, 1/4 inch.
2. Variations exceeding above tolerances shall be satisfactorily corrected at no additional cost to the Owner.
3. Check surface areas at intervals as directed by the Owner's Representative.

3.5 TEMPORARY PAVEMENT:

- A. Where trench excavations have been performed within an existing street, furnish and lay a temporary pavement on an approved subgrade to the lines and grades specified herein. Cut the existing pavement with suitable tools as specified in Division 31 Section 312000 Earthwork. The construction of the temporary pavement shall consist of 2-inch compacted thickness of hot-mix asphaltic concrete unless otherwise specified by the Owner's Representative.

- B. Before the material is spread, paint all curb edgings, surfaces of manholes and other

structures which will come into contact with the new pavement with a bituminous emulsion or priming material acceptable to the Owner's Representative. Take care to prevent staining, smearing or defacing the exposed faces of the curbs and other structures during the spreading and rolling of the material.

- C. After spreading, roll the material by means of a well-balanced roller weighing not less than 15 tons. In all places not accessible to the roller, compact the material thoroughly by tampers weighing not less than 25 pounds and having a bearing area not exceeding 50 square inches.
- D. Maintain temporary pavement until such time that the final settlement of the trench shall have taken place in the opinion of the Owner's Representative. Correct any settlement taking place by furnishing, spreading and rolling additional material over that previously laid.

3.6 PAVEMENT REPLACEMENT:

- A. In areas where temporary pavement has been placed, remove said temporary pavement to the subgrade line as specified. Bring the subgrade to the proper elevation and compact it.
- B. Where specified by the Owner's Representative, excavate a shelf to provide a bearing area on all sides for the new pavement. The width of said shelf and pavement thickness shall be as shown on the plans or as directed by the Owner's Representative.

END OF SECTION 32 1216

SECTION 32 1313 – CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK:

A. General

1. Extent of cement concrete paving is shown on drawings for all walks.
2. Prepared subbase is specified in Division 31 Section 31 2000 Earthwork.

1.3 QUALITY ASSURANCE:

A. Codes and Standards

1. Comply with local governing regulations if more stringent than herein specified.

B. Submittals

1. Furnish samples, manufacturer's product data, test reports and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

1.4 JOB CONDITIONS:

- A. No concrete shall be placed in the work when the temperature is below 32°F or when the temperature is likely, in the opinion of the Owner's Representative, to drop to 32°F within the next 24 hours, except with the prior approval of the Owner's Representative and under special protective measures approved by the Owner's Representative.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Forms

1. Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms free of distortion and defects.
2. Use flexible spring steel forms or laminated boards to form radius bends as required.
3. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

- B. Welded Wire Mesh
 - 1. Welded plain cold-drawn steel wire fabric, ASTM A 185.
- C. Reinforcing Bars
 - 1. Deformed steel bars, ASTM A 615, Grade 40.
- D. Concrete Materials
 - 1. Comply with requirements applicable for concrete materials, admixtures, bonding materials, curing materials and others as required.
- E. Expansion Joint Materials
 - 1. Comply with requirements for preformed expansion joint fillers and sealers.

PART 3 - EXECUTION

3.1 CONCRETE MIX, DESIGN AND TESTING:

- A. General
 - 1. Comply with requirements applicable for concrete mix design, sampling and testing, and quality control, and as herein specified.
 - 2. Design mix to normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (super-plasticizer), air-entraining admixture and water to produce the following properties:
 - a. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated.
 - b. Slump Range: 4 inches for concrete containing HPWR admixture (super-plasticizer); 4 inches for other concrete.
 - c. Air Content: 4.5 to 7.5 percent.

3.2 SURFACE PREPARATION:

- A. General
 - 1. Remove loose material from compacted subbase surface immediately before placing concrete.
 - 2. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.3 FORM CONSTRUCTION:

- A. General
 - 1. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
 - 2. Check completed formwork for grade and alignment to following tolerances:

- a. Top of forms not more than 1/8 inch in 10 feet.
 - b. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
3. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.

3.4 REINFORCEMENT:

A. General

1. Locate, place and support reinforcement as shown on details, unless otherwise indicated.

3.5 CONCRETE PLACEMENT:

A. General

1. Comply with requirements for mixing and placing concrete and as herein specified.
2. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator.
4. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

3.6 JOINTS:

A. General

1. Construct expansion, weakened-plane (contraction) and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
2. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints

1. Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.

C. Expansion Joints

1. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
2. Locate expansion joints at 20 feet o.c. maximum, unless otherwise indicated.

3. Extend joint fillers full-width and depth of joint, recessed 1/2 inch below finished concrete surface.
4. Furnish joint fillers in one-piece lengths for full width being place.
5. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

D. Fillers and Sealants

1. All joints shall receive joint sealants. Comply with requirements for preparation of joints, materials, installation and performance.

3.7 CONCRETE FINISHING:

A. General

1. Protect and cure finished concrete paving as specified on the plans and details. Use membrane-forming curing and sealing compound or approved moist-curing methods.

B. Anti-Spalling Treatment

1. A second coat of curing and sealing compound may be used or an anti-spalling compound applied over concrete cured by continuous moist curing methods. Apply compounds to concrete surfaces no sooner than 28 days after placement, to clean, dry concrete free of oil, dirt and other foreign material. Apply curing and sealing compound at a maximum coverage rate of 300 square feet per gallon. Apply anti-spalling compound in two sprayed applications. First application at rate of 40 square yards per gallon; second application, 60 square yards per gallon. Allow complete drying between applications.

3.8 REPAIRS AND PROTECTIONS:

A. General

1. Repair or replace broken or defective concrete, as directed by Owner's Representative.
2. Drill test cores where directed by Owner's Representative when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
3. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
4. Sweep concrete pavement and wash free of stains, discolorations, dirt and foreign material just prior to final inspection.

END OF SECTION 32 1313

SECTION 33 1373 – PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Cold-applied joint sealants.
 - 2. Hot-applied joint sealants.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Pavement-Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Product Certificates: For each type of joint sealant and accessory, from manufacturer.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40°F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.
- B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.
- C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

2.3 PRIMERS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance. All expansion and isolation joints including work adjacent to structures and other materials shall receive a joint sealant.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

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

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place joint sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- D. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
 - 1. Remove excess joint sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- E. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING

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

3.5 PROTECTION

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

3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Joints within cement concrete pavement.
 - 1. Expansion and isolation joints in cast-in-place concrete pavement.
 - 2. Contraction joints in cast-in-place concrete slabs.
 - 3. Other joints as indicated.

- B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.
 - 1. Joint Location: Joints between concrete and asphalt pavement.
 - 2. Joints between concrete curbs and asphalt pavement.
 - 3. Other joints as indicated.

END OF SECTION 32 1373

SECTION 32 9100 – PLANTING SOILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.
- B. Section 31 2300 – Earthwork
- C. Section 32 9000 – Planting
- D. Section 32 9200 – Turf and Grasses

1.2 RELATED SECTIONS

- A. Testing off-site borrow soil, existing topsoil and amendment materials for approved use in planting soil mixes. Verification testing of on-site sub-soils.
- B. Furnishing material from approved off-site source(s) as a base component for planting soil mixes and furnishing other soil amendment materials.
- C. Amending, preparing, and mixing planting soils for plant areas.
- D. Placing, spreading, and fine grading pre-mixed planting soil material of the type(s) indicated for plant areas.
- E. Protecting all plant mix installations with snow fencing, filter fabric, or other approved means, over the surface area plant bed installations, until substantial completion.
- F. Protection of finished paving, light poles utility or other finished work by means of wooden protection boards, or other approved means, over the area of construction concurrent with any and all construction operations.

1.3 SUBMITTALS

- A. Refer to and comply with General Requirements, for procedures and additional submittal criteria.
- B. Product Data: Submit technical descriptive data for each manufactured or packaged product of this Section. Include manufacturer's product testing and analysis and installation instructions for manufactured or processed items and materials.
- C. Locations: Submit locations of material sources. Submit location of mixing sites.
- D. Certificates:
 - 1. Submit certified analysis for each soil treatment, amendment, and fertilizer material specified and as used. Include guaranteed analysis and weight for packaged materials.
- E. Test Reports: Submit written reports of each sample tested. Each report shall include the following as a minimum and such other information required specific to material tested:

1. Date issued.
 2. Project Title and names of Contractor and supplier.
 3. Testing laboratory name, address and telephone number, and name(s), as applicable, of each field and laboratory inspector.
 4. Date, place, and time of sampling or test, with record of temperature and weather conditions.
 5. Location of material source.
 6. Type of test.
 7. Results of tests including identification of deviations from acceptable ranges. Identify any toxic substance(s) harmful to plant growth or life.
- F. Statement(s) of Qualifications: Submit within 45 days of notice to proceed to confirm qualifications as specified in Article 1.04, herein.
- G. Schedule and Protection Plan: Submit a detailed plan for scheduling and sequencing of all contract work and for protection of soil mixes and other completed work including coordination with contractors requiring access through the site. Indicate with schedules and plans the utilization of soil mix and subsoil protection measures (filter fabric and snow fencing) over the surface area of plant bed installations, until substantial completion. Indicate with schedules and plans the utilization of finished work protection measures (wooden protection boards or other approved methods) over the work area of construction operations concurrent with all construction operations until substantial completion.

1.4 QUALITY ASSURANCE

- A. Qualifications:
1. Installation and maintenance foreman on the job shall be competent English-speaking supervisor(s), experienced in landscape installation and maintenance. Perform work with personnel totally familiar with planting soil preparation and planting installations under the supervision of a foreman experienced with landscape work.
 2. Agricultural Chemist: Experienced person or persons employed by public or private soils testing laboratory, qualified and capable of performing tests, making soil recommendations, and issuing reports as specified. Testing Laboratory and Agricultural Chemist shall be as approved by the Owner's Identified Agent.
- B. References:
1. Association of Official Agricultural Chemists.
 2. American Society for Testing and Materials (ASTM) using test criteria as specified or required by other references.
- C. Pre-installation Conferences: Person(s) responsible for soil preparation and mixes of this Section shall attend Pre-installation Conference(s) to coordinate with work of other sections.
- D. Inspections and Testing

1. Soil, compost, and other material testing required in this Section or additionally required by Owner's Representative shall be furnished and paid for by Contractor.
2. Owner's Identified Agent reserves the right to take and analyze at any time such additional samples of materials as deemed necessary for verification of conformance to specification requirements. Contractor shall furnish samples for this purpose upon request and shall perform testing as requested.
3. If at any time, test results indicate that any soil delivered to the site does not comply with these specifications, the contractor shall immediately remove the non-compliant soils from site at the contractor's expense.

1.5 REGULATORY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of local, state, and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary to make work comply with such requirements without additional cost to Owner.
- B. Procure and pay for permits and licenses required for work of this section. Comply with the requirement of any Remedial Action Work Plan that may apply to the project.

1.6 PROJECT/SITE CONDITIONS

- A. Acquaintance with Existing Site Conditions
 1. Through study of all Contract Documents and by careful examination of the site, become informed as to the nature and location of the Work, the nature of surface and subsurface soil conditions, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work.
 2. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of this work site. Conform to all governmental regulations in regard to the transportation of materials to, from, and at the job site, and secure in advance such permits as may be necessary.
 3. Should the Contractor, in the course of Work, find any discrepancies between Contract Drawings and physical conditions or any omissions or errors in Drawings, or in layout as furnished by the Owner, it will be Contractor's duty to inform the Owner's Identified Agent immediately in writing for clarification. Work done after such discovery, unless authorized by the Owner's Identified Agent, shall be done at the Contractor's risk.
 4. Contractor shall be familiar with any Remedial Action Work Plan for the project and be experienced in working on sites with historic fill.
- B. Environmental Requirements:
 1. Perform both off-site mixing and on-site soil work only during suitable weather conditions. Do not disc, rototill, or work soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

2. Soil mixes shall not be handled, hauled, or placed during rain or wet weather or when wet near or above field capacity.

C. Sequencing and Scheduling: Adjust, relate together, and otherwise coordinate work of this Section with work of Project and all other Sections of Project Specifications.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials to the location where soils are to be mixed, in unopened bags or containers, each bearing the name, guarantee, and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the materials Retain packages for the Construction Manager or Owner's Representative.

B. Soil or amendment materials stored on site temporarily in stockpiles prior to placement shall be protected from intrusion of contaminants and erosion. All temporary storage means and methods shall be approved by Owner's Representative.

C. After mixing, soil materials shall be covered with a tarpaulin until time of actual use.

PART 2 - PRODUCTS

2.1 PLANT MIX MATERIALS

A. All soil material to be imported to the site shall be tested every 500 CY to ensure soils meet applicable remediation standards for clean soils. Proof of compliance shall be provided by contractor prior to delivery of soils to site.

B. General:

1. All plant mix materials shall fulfill the requirements for new plant mixes as specified.
2. Samples of blended plant mixes shall be submitted by the Contractor for testing and analysis to the approved testing laboratory. Include verification testing of on-site sub-soils. Comply with specific material requirements specified.
 - a. As necessary to conform to the requirements of these specifications, make any and all soil mix amendments, retest and resubmit reports indicating results until approved.
3. Owner's Representative may request additional testing by Contractor for confirmation of mix quality at any time until completion.

C. Base Component Material

1. Base Component Material shall be a mix of sandy loam and sand. Base Component Materials shall not be site salvaged unless approved by Owner's Identified Agent and CT DEEP.
2. Before base component material is used for mixing with amendments, handle and pile Base Component Material in the following manner:
 - a. Homogenize to make a uniform mix, free of subsoil lenses and other irregularities.
 - b. Aerate the base material to make a friable planting medium.

- c. Separate out and remove all clay lumps, stones, stocks, roots, and other debris.
- D. Organic Matter
 - 1. Leaf Mold: Shredded leaf litter, composted for a minimum of one year (12 months) and confirming to the following characteristics:
 - a. The leaf mold must be free of debris such as plastic fragments, glass, and metal fragments.
 - b. The leaf mold must be free of stones larger than 1/2", large branches, and large roots.
 - c. Woodchips over 1" in length or diameter should be removed by screening.

2.2 SOIL AMENDMENT MATERIAL

- A. Ground Limestone: Ground Limestone as a soil amendment material will only be used pending results of analysis.
 - 1. Provide a Ground Agricultural Limestone with a minimum of 88% of calcium and magnesium carbonates.
 - 2. Ground Limestone material shall have a total 100% passing the 10 mesh sieve, minimum of 90% passing the 20 mesh sieve, and a minimum of 60% passing the 100 mesh sieve.

2.3 HERBICIDES

- A. Herbicides: May be required for use if there is seed germination after sub-grade placement and prior to planting mix installation or after subsequent plant mix installation. Under no circumstances are materials to be applied without specific instruction from the Owner's Identified Agent.
 - 1. Herbicides shall be approved before use for type and rate of application by the Owner's Identified Agent and by local and state agencies with jurisdiction.
 - 2. Post emergent herbicide shall be Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166, or an approved equal.

2.4 PLANTING SOIL MIXES

- A. Adequate quantities of mixed planting soil materials shall be provided, to supplement topsoil stockpiled from site, to attain, after compaction and natural settlement, all design finish grades. Verify quantities for placement as specified in Planting and Turf and Grasses specifications and to suit conditions.
- B. Uniformly mix ingredients as specified (Base Component Material, leaf mold, and other ingredients deemed to be necessary as a result of testing) by wind rowing/tilling on an approved hard surface area. Organic matter shall be maintained moist, not wet, during mixing.
- C. Testing of Plant Mixes:

1. Perform initial soil mix tests to confirm compliance with specifications. In conjunction with the requirements of the specifications, these test results, when approved, will establish the standard to which all other test results must conform.
 2. Follow-up Testing: Have one (1) composite sample tested prior to delivery and upon arrival to the site from each 500 c.y. of material or as required by Owner's Representative intended for use in each type of lawn and plant mix to include the following:
 - a. Soil Texture / Physical Analysis: Use the hydrometer method and classify the soil.
 - b. Nutrient Analysis:
 - 1) Have nutrient levels (nitrate, nitrogen, phosphate, potassium, magnesium, calcium, ammonium, iron, and manganese) tested, and request testing laboratory recommendations for additional fertilizer requirements at both lawn and all plant areas if nutrient levels are below average.
 - 2) Nutrient deficiencies in soils of plant areas shall be corrected at time of installation.
 - 3) Nutrient deficiencies in soils of lawn areas shall be corrected both at time of lawn installations and during maintenance period as specified.
 - c. Test organic matter, pH, soluble salts, and percolation.
- D. Soil Mix Types: Provide the following planting soil mix at the locations indicated. Percentages of components, unless otherwise noted, will be established upon completion of test results of the various mixes. The controlling factor will be the percent (%) organic matter as specified for each mix. Note that percent (%) by volume of components will be, in large part, determined by the leaf mold. Specifically, the bulk density reading of the leaf mold will directly impact the organic matter readings which have been specified for each mix.
1. Topsoil / Horticultural Soil Mix shall be used for planting areas on natural subsoils.
 - a. Test results must be submitted for per-cent (%) retained as well as for per-cent (%) passing for all sieve sizes. Failure to include any of the aforementioned criteria will be cause for rejection of the test report.
 - b. Soil Texture/ Physical Analysis
 - 1) Sand – 40-65%
 - 2) Silt – 25-60%
 - 3) Clay – 5-20%
 - 4) Gravel content should not exceed 3% and soil should be free of glass, plastic and other foreign materials
 - c. Chemical Analysis:
 - 1) Organic matter: 4.5 to 7.5%
 - 2) Soil reaction (pH): 6.0 to 7.0
 - 3) Soluble salt content (conductivity): The soluble salts measurement

(Electric Conductivity) should not exceed 0.5 mmhos/cm measured as a 1: 5 dilute.

- d. Heavy metal content not to exceed the following amounts:

<u>Element</u>	<u>Acetate Extract</u>	<u>HCL Extract</u>
Iron	0.5 ppm	3.1 ppm
Manganese	0.5 ppm	15.4 ppm
Molybdenum	0.4 ppm	0.8 ppm
Zinc	0.2 ppm	4.4 ppm
Aluminum	0.2 ppm	1.2 ppm
Boron	1.1 ppm	1.7 ppm
Copper	None	0.01 ppm
Lead	01 ppm	0.4 ppm
Selenium	None	0.4 ppm
Mercury	None	None
Chromium	None	None
Cadmium	None	0.02 ppm
Nickel	None	0.04 ppm
Cobalt	None	0.05 ppm

None = none detected = below detection limits of 0.01 ppm.

- e. Percolation: 60% passing in 2 minutes, 40% retained. Soil should be saturated prior to conducting test.
- f. Other Amendments as required by test results and as approved.

E. Stockpiling and Plant Mixes

1. General: Stockpiling and Plant Mixes utilized for planting soil on-site, off-site and at source should be restricted to no more than the needs of what can be used in a 24-hr. period. Stockpiles should be no more than 6 feet in height to prevent anaerobic conditions within the pile(s). Stockpiles shall be sheltered from weather to prevent excessive water absorption and blowing by winds as approved by Owner's Representative.

2.5 VERIFICATIONS

- A. Prior to construction and soil placement operations at planting areas, ascertain the location of all electric cables, conduits, underdrainage systems and utility lines.
- B. Take proper precautions so as not to disturb or damage sub-surface elements. Contractor failing to take these precautions shall be responsible for making requisite repairs to damaged utilities at Contractor's own expense.
- C. Verify that required underground utilities are available, in proper location, and ready for use. Coordinate with other trades.

- D. Verify that all work requiring access through or adjacent to areas where plant mixes are to be placed has been completed and no further access will be required. In the event that access will be required, this must be coordinated with the Owner's Representative.

2.6 PREPARATION OF SUBGRADE

- A. Prior to depositing and spreading clean fill, sand and/or plant mix soils, the Contractor shall furnish and install grade stakes on a 10 foot grid in open areas and sufficiently spaced in other areas to insure correct line and grade of subgrade and finished grade.
 - 1. Verify as constructed or existing subgrade elevations and do whatever additional grading is necessary to bring the subgrade to a true, smooth, slope parallel to the finish grade at all areas to receive planting soil for lawns.
 - 2. Clean up subgrade and dispose of all debris and garbage prior to inspection.
 - 3. Scarify compacted subgrades to permit drainage through soil layers.
- B. Remove all vegetation on subgrade or wherever additional soil is to be added to meet grade.
- C. Any soils polluted by gasoline, oil, plaster, construction debris, unacceptable soils, or other substances which would render subgrade unsuitable for a proper lawn or plant growth, shall be removed from the premises whether or not such pollution occurs or exists prior to or during the Contract period. In the event that such material is placed, this material shall be removed and replaced with approved material. All remedial operations associated with soil mixes and controlled fill shall be reviewed and approved by the Owner's Representative responsible for remediation, when applicable.

2.7 PLACING PLANTING SOIL

- A. Remove all large clods, lumps, brush, roots, stumps, litter, and other foreign material and stones one-half inch (1/2") in diameter or larger. Dispose of removed material legally off-site.
- B. Do not place a muddy or wet soil mix.
- C. Place and spread planting soil mix of the type specified over approved subgrade to a depth sufficiently greater than the depth required for planting areas so that after natural settlement, misting and/or light rolling, as previously approved by Owner's Identified Agent, the completed work will conform to the lines, grades, and elevations shown or otherwise indicated.
- D. Topsoil/ Planting Soil Mix shall be placed at the following minimum depths, or as otherwise directed by the plans in all areas over natural subsoils.
 - 1. Lawn Areas – 6" minimum
- E. Grading Tolerances: Lawn and Planting areas shall be fine graded within $\pm 1/10$ (0.10) feet of grades indicated on drawings. Maintain all "flat" areas and slopes to allow free flow of surface drainage without ponding.

END OF SECTION 32 9100

SECTION 32 9200 – TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.
- B. Section 31 2000 – Earthwork
- C. Section 32 9100 – Planting Soils

1.2 SUMMARY

- A. Section Includes:
 - 1. Sodding.

1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- H. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

1.5 SUBMITTALS

- A. Certification of Lawn
 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.
- B. Qualification Data: For qualified landscape Installer.
- C. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- D. Material Test Reports: For standardized ASTM D 5268 topsoil existing native surface topsoil existing in-place surface soil and imported or manufactured topsoil.
- E. Maintenance Instruction Manual: Contractor to submit a manual that includes recommended procedures and schedules to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 2. Experience: Five years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 4. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
 5. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.
- C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

1.8 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion
- B. Sod Installation Season
 1. Spring: April 15 to July 15
 2. Fall: August 15 to November 1

Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 1. Seeded Turf: 90 days from date of Substantial Completion
 - a) When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.
 2. Sodded Turf: 60 days from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

- A. Turfgrass Sod: Certified complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Closely match seed species specified in plans

2.2 FERTILIZERS

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb./1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.3 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

2.4 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.5 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Hand-dig or air spade in all areas under the drip line of existing trees.
- C. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
 - a) Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b) Mix lime with dry soil before mixing fertilizer.

- D. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 8 inches. Till soil to a homogeneous mixture of fine texture.
 - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- E. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus ½ inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- F. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- G. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 - 1. Lay sod across angle of slopes exceeding 1:3.
 - 2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.5 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- C. Mow areas designated as lawn on the plan as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowing. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Retain applicable subparagraphs below for mowing height. For seed mixtures, base selection on predominant species to be established.
- D. Areas hatched as 'Fescue Mix' on plan shall not be mown more that twice a year, Do not mowing shorter than 4".
- E. Turf Post fertilization: Apply fertilizer after initial mowing and when grass is dry.
1. Use fertilizer that will provide actual nitrogen of at least 1 lb./1000 sq. ft. to turf area.

3.6 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.7 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already germinated weeds and in accordance with manufacturer's written recommendations.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 32 9200