Entry Renovations

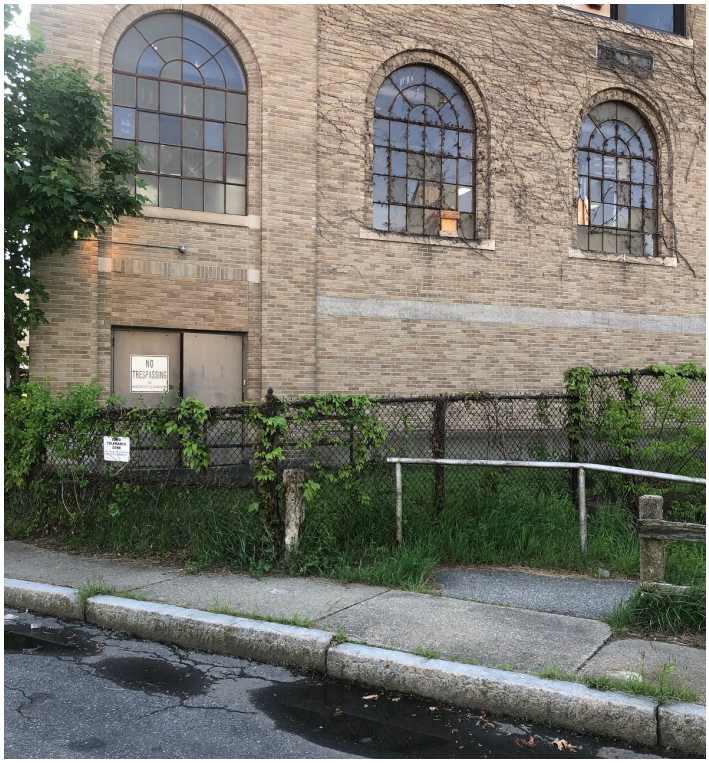
at the

Fanning School

for

Worcester Public Schools

March 6, 2025



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END OF SECTION
00.01.10

SECTION 01.11.00

SUMMARY OF WORK

I PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. This section supplements the Conditions of the Contract, Prime Requirements, Drawings, and all other parts of the Contract Documents.

B. This Contractor must be familiar with all other Divisions and Sections of the Specifications which affect the work of this Section.

1.02 REQUIREMENTS INCLUDED

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1.03 WORK UNDER THIS CONTRACT

A. The work to be done under this contract consists of executing and completing all work required for the removal of the existing rear entry doors, concrete landing, railing, stairs, etc. for the installation of a new accessible ramp system, new entry doors and required re-grading re-planting. Replacing of select damages concrete entry paths.

B. The scope of work, without limiting the generality thereof, includes all labor, materials, equipment and services required to perform the work described fully in the Drawings and Specifications and includes, but is not limited to the following major work:

1. Abatement of ACM around select entry doors.

2. Removal of select entry doors, frame and hardware.

3. Removal of existing concrete landing, metal railings and stairs.

4. Cutting back existing vegetation and removal of existing sections of fence to perform site work.

5. Removal of existing damage concrete walkways to replace them in kind.

6. Remove and re-set select existing granite stairs.

7. Install new accessible concrete ramp system, rails and stairs.

8. Install new door frames, new doors and new hardware.

9. Install new concrete walkways to replace existing removed.

10. Re-grade existing areas as required and re-seed.

C. The following major elements will be performed by the Owner, under separate contracts, for which the Prime Contractor has a coordinating responsibility:
   1. Removing any loose items from / around the project are in order to perform the scope of work.

D. The following major elements will be furnished by the Owner, for installation by the Contractor or sub-contractors:
   1. None. The Contractor shall furnish all materials and labor required for the execution of this project.

E. Reference to Drawings: included with the bid package, but not in the project manual, they are separate D-Size sheets.

F. Prevailing Wage: The Massachusetts Standard Labor Wage rates, as outlined in the exhibits, will be used in the construction of this project

G. **Start of Work: The work may start on site the day after the last day of school. The last day of school is currently scheduled for June 18, 2025, but may change as a result of additional snow days.**

1.04 EXAMINATION OF SITE AND DOCUMENTS

A. A pre-bid meeting will be held at the job site on the date and at the time indicated in the Invitation to Bid.

B. Bidders may also visit the site on a non-holiday weekday acceptable to the Owner, between the hours of 9:00 AM and 3:00 PM to visually inspect the location of the work and existing conditions that may affect new work provided that coordinate the visit with WPS and the main office.

C. The bidders are expected to examine and to be thoroughly familiar with all contract documents and with the conditions under which the work is to be carried out. The Owner and Designers will not be responsible for errors, omissions, and/or charges for extra work arising from the Contractor's or Subcontractor's failure to familiarize themselves with the contract documents. The Contractor and Subcontractors acknowledge that they are familiar with the conditions and requirements of the contract documents where they require, in any part of the work a given result to be produced, and that the contract documents are adequate and will produce the required results.

1.05 CONTRACT METHOD

A. Work under this contract shall be lump sum price, for the scopes of work as described in these specifications and shown on the Drawings.

1.06 WORK SEQUENCE

A. The Work will be conducted in the following sequence of demolition/construction:

1. Actual sequence of the work will be left to the discretion of the Contractor, who will prepare a construction schedule showing the sequence and duration of work, for review and approval by the Owner.

1.07 SUPERVISION OF WORK

A. The Contractor shall be held directly responsible for the correct installation of all work performed under this Contract. The Contractor must make good repair, without expense to the Owner, of any part of the new work, or existing work to remain, which may become inoperative on account of leaving the work unprotected or unsupervised during construction of the system or which may break or give out in any manner by reason of poor workmanship, defective materials or any lack of space to allow for expansion and contraction of the work during the Contractor's warranty period, from the date of final acceptance of the work by the Owner.

B. The Contractor shall furnish a competent Massachusetts licensed superintendent satisfactory to the Owner and to the Designer. The licensed superintendent shall supervise all work under this contract and who shall remain on duty at the site throughout the Contract period while work is in progress.

1. Submit the name and resume of the superintendent for approval to the Architect. Include experience with projects of equal size and complexity.

1.08 CONTRACTOR'S USE OF PREMISES

A. Use of the Site: Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy and use by the public (if applicable).

2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Schedule and perform work to afford minimum of interruption to normal and continuous operation of utility systems. Submit for approval, a proposed schedule for performing work; including construction of new utilities, re-routing of existing utilities and final connection of new work to existing work. Schedule shall indicate shutdown time required for each operation.

C. The Contractor shall schedule as per Section 01.50.00 - Temporary Facilities and Controls, the shutting down or interrupting any utilities, services or facilities which may affect the operation of the building outside the area of work or other buildings, services or facilities.

D. The Contractor can gain access to the premises during the hours specified below. In addition the Contractor and his personnel will limit themselves only within the working premises during working hours. If work needs to be scheduled during times other than those listed below, Contractor shall inform the Owner one week prior to work.

1. Deliveries: **7:00 AM to 3:00 PM**, but only when the contractor is present on site.
2. Work on site:
   (a) **7:00 AM to 3:00PM** while school is not in session.
   (b) Other work times must be co-ordinated and approved with WPS.
   (c) *If the contractor chooses to work during times when the school is not staffed, weekends or after 3PM, etc., and it is approved by the owner, the contractor shall be responsible for all additional overtime / oversight charges that will be incurred.*
   (d) The contractor may work longer shifts than noted above, but the timing will need to be coordinated with WPS and the school, and any additional cost incurred for this work will be the

responsibility of the contractor unless otherwise coordinated with WPS.

3. Weekends: At contractor's discretion and as allowed by Owner. No additional compensation for overtime.
4. Holidays: As coordinated with the owner.

E. The Contractor shall verify that Subcontractors have visited the site and included all costs associated with the location of the project, and any restriction or limitations the location of the project may pose.

F. All contractors shall at all times conduct their operations in a courteous, professional manner while on the project or in the vicinity of the project. Harassment, offensive language or behavior will not be permitted on the site.

G. The Owner can neither accept nor assume responsibility for the security of the Contractor's material or equipment which is lost, stolen or vandalized. The Contractor is advised to exert caution in placement and storage of his equipment and material.

H. Parking: Work is anticipated to start while school is not in session, but the Contractor will need to get parking area approval by the school. Some continued use of the building by WPS staff or custodians is anticipated, and contractors shall cooperate with the Owner and the staff, and park where directed.

I. Radios, tape players, "boom boxes", or other audio entertainment equipment, including personal entertainment devices, shall not be allowed on the project site.

J. The Contractor shall not permit smoking within the building on school grounds.

K. The Contractor shall not allow the use of intoxicating beverages or non-prescription controlled substance drugs upon or about the work site.

L. The Contractor shall provide and maintain in good serviceable condition at all times, warning signs and barriers, approved by the Owner, suitable for the purpose, and installed adjacent to each work area. Barriers shall be barrier tape and/or sawhorses as a means of such access protection.

1.09 COORDINATION

A. The Contractor shall be responsible for the proper fitting of all the work and for the coordination of the operations of all Subcontractors or material and persons engaged upon the work. The Contractor shall do, or cause his agents to do, all cutting, fitting, adjusting, and repair necessary in order to make the several parts of the work come together properly.

1. Examine Contract Documents in advance of start of construction and identify in writing questions, irregularities or interference to the designer in writing. Failure to identify and address such issues in advance becomes the sole responsibility of the Contractor. A conflict that would cause the reduction of the normal ceiling height of any occupied space is considered to be an interference.

B. Execute the work in an orderly and careful manner with due regard to the occupants of the facility, the public, the employees, and the normal function of the facility.

C. The work sequence shall follow planning and schedule established by the Contractor as approved by the Designer and the Owner. The work upon the site of the project shall commence promptly and be executed with full simultaneous progress. Work operations which require the interruption of utilities, service, and access shall be scheduled so as to involve minimum disruption and inconvenience, and to be expedited so as to insure minimum duration of any periods of disruption or inconvenience.

D. The Contractor shall review the tolerances established in the specifications for each type of work and as established by Subcontractor organizations. The Contractor shall coordinate the various Subcontractors and resolve any conflicts that may exist between Subcontractor tolerances without additional cost to the Owner.

The Contractor shall provide any chipping, leveling, shoring or surveys to ensure that the various materials align as detailed by the Designer and as necessary for smooth transitions not noticeable in the finished work.

1.10 PROJECT MEETINGS

A. Project meetings shall be held on site at intervals appropriate to the progress of the Work and as required subject to the discretion of the Owner.

1. Attendees: In addition to the Project Manager and Designer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

B. In order to expedite construction progress on this project, the Contractor shall order all materials immediately after the approval of shop drawings and shall obtain a fixed date of delivery to the project site for all materials ordered which shall not impede or otherwise interfere with construction progress. The Contractor shall present a list and written proof of all materials and equipment ordered (through purchase orders). Such list shall be presented at the meetings and shall be continuously updated.

C. Scheduling shall be discussed with all concerned parties, and methods shall be presented by the Contractor, which shall reflect construction completion not being deferred or foreshortened. Identify critical long-lead items and other special scheduling requirements. The project schedule is to include time for submission of shop drawing submittals, time for review, and allowance for resubmittal and review.

1.11 PERMITS, INSPECTION, AND TESTING REQUIRED BY GOVERNING AUTHORITIES

A. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having any jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Designer, the Owner or his/her designated representative, and such Authority timely notice (5 business days minimum) of its readiness so the Designer may observe such inspecting, testing, or approval.

B. Prior to the start of construction, the Contractor shall complete application to the applicable Building Code enforcement authority for a Building Permit. Such Permit shall be displayed in a conspicuous location at the project site. The building permit fee shall be paid by the Contractor.

C. Unless otherwise specified under the Sections of the Specifications, the Contractor shall pay such proper and legal fees to public officers and others as may be necessary for the due and faithful performance of the work and which may arise incidental to the fulfilling of this Contract. As such, all fees, charges, and assessments in connection with the above shall be paid by the Contractor.

D. Contractor and specialized Subcontractors as applicable shall identify all permits (other than building permit) required from Authorities having jurisdiction over the Project for the construction and occupancy of the work. The Contractor shall prepare the necessary applications and submit required plans and documents to obtain such permits in a timely manner, and shall furnish the required information to the Building Official and obtain the required permits as early as practicable after award of the Contract.

E. Prior to the start of construction, the Contractor shall complete applicable applications, permits, and notifications to the MADEP, such as the Demolition/Construction form BWP AQ-06, and pay the required fees. These forms must be submitted at least 10 working days in advance of any regulated activity on the site. Demolition permits must be submitted for any work involving demolition, new construction and renovation.

1.12 CUTTING, CORING, AND PATCHING, UNLESS OTHERWISE INDICATED

A. The Contractor shall coordinate that the work of the Subcontractor is not endangered by any cutting, coring, excavating, or otherwise altering of the work and shall not allow the cutting or altering the work of any

Subcontractor except with the written consent of the Designer.

B. Performance:

1. Execute cutting and patching by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

   (a) In general, where mechanical cutting is required, cut work with sawing and grinding tools, not with hammering and chopping tools.

2. Employ original installer or fabricator to perform cutting and patching for:
   (a) Weather-exposed or moisture-resistant elements.
   (b) Sight-exposed finished surfaces.

3. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

4. Restore work which has been cut or removed; install new products matching existing to provide completed Work in accordance with requirements of Contract Documents.

5. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

6. Patch with seams which are durable and as invisible as possible. Flash and seal all penetration of exterior work. Comply with specified tolerances for the work.

7. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
   (a) Where patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch.

8. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
   (a) For continuous surfaces, refinish to nearest intersection.
   (b) For an assembly, refinish entire unit.

C. Existing Utilities Services:

1. Interruptions to critical existing utility services will not be allowed except as scheduled per Section 01.50.00 - Temporary Facilities and Controls.

2. All exposed conduits, wires, and/or cables shall be provided with sufficient protection and support to prevent failure, fraying, or damage due to backfilling or other construction operations.

1.13 DEBRIS REMOVAL

A. The Contractor shall coordinate the removal of all demolition and construction waste including waste by all Subcontractors from the job site on a daily basis.

B. Debris shall be legally disposed of in a D.E.P. approved disposal site.

C. The Contractor shall bear responsibility for maintaining the building and site clean and free of debris, leaving all work in clean and proper condition satisfactory to the Owner and the Designer. The Contractor shall ensure that each of the Subcontractors clean up during and immediately upon completion of their work. Clean up includes the following tasks:

1. Remove all rubbish, waste, tools, equipment, appurtenances caused by and used in the execution of work.

D. Prevent the accumulation of debris at the construction site, storage areas, parking areas, and along access roads and haul routes.

E. Provide containers for deposit of debris and schedule periodic collection and disposal of debris.

F. Prohibit overloading of trucks to prevent spillage on access and haul routes.

G. The Contractor shall be responsible for proper disposal of all construction debris leaving the site.

1.14 FIELD MEASUREMENTS

A. Although care has been taken to ensure their accuracy, the dimensions shown for existing items and structures are not guaranteed. It is the responsibility of the Contractor to verify these dimensions in the field before fabricating any construction component. No claims for extra payment due to incorrect dimensions will be considered by the Owner.

1.15 SAFETY REGULATIONS

A. This project is subject to compliance with Public Law 91 596 "Occupational Safety and Health Act" latest edition (OSHA 29 CFR 1926), with respect to all rules and regulations pertaining to construction, including Volume 36, numbers 75 and 105, of the Federal Register, as amended, and as published by the U.S. Department of Labor.

B. Hazardous Waste Generation: Any work generating Hazardous or so-called Universal Wastes will comply with all requirements of 310 CMR 30.000. The proper storage, use and disposal of any hazardous chemicals or substances brought on site by the Contractor are the responsibility of Contractor. The Owner will not be responsible for any hazardous materials left on site, the cost to remove these materials will be the Contractor's responsibility. All hazardous wastes generated as a result of demolition and remodeling shall be contained, collected, segregated, labeled per all applicable federal EPA, Massachusetts DEP, and Federal DOT regulations or other applicable local, state or federal hazardous waste regulations, pending the appropriate disposition.

1.16 OSHA SAFETY AND HEALTH COURSE DOCUMENTATION

A. OSHA Safety and Health Course Documentation Records: Chapter 306 of the Massachusetts Acts of 2004 requires that everyone employed at the jobsite must complete a minimum 10-hour long course in construction safety and health approved by the U.S. Occupational Safety and Health Administration (OSHA) prior to working at the jobsite. Compliance is required of Contractors' and Subcontractors' on-site employees at all levels whether stationed in the trailer or working in the field. Unless the Massachusetts Attorney General's office indicates otherwise, this requirement does not apply to home-office employees visiting the site or to suppliers' employees who are making deliveries.

B. OSHA 10 cards for anyone working on site are to be submitted prior to the first requisition.

C. Documentation records shall be initially compiled by the Contractor and Subcontractors, and the Contractor shall create and maintain a copy of the documentation on site at all times.

1.17 DAMAGE RESPONSIBILITY

A. The Contractor shall repair, at no cost to the Owner, any damage to building elements, site appurtenances, landscaping, utilities, etc. caused during demolition operation and work of this Contract.

1.18 OWNER FURNISHED PRODUCTS

A. None.

1.19 ASBESTOS AND HAZARDOUS MATERIALS DISCOVERY

A. **See Section 02.08.00 - Abatement and Appendix A for items tested / results / scope.**

B. If unanticipated asbestos-containing materials or other Hazardous Materials not included in Contract are discovered at any time during the course of work, the Contractor shall cease work in the affected areas only and continue work in other areas, at the same time notify the Designer of such discovery. Do not proceed with work in such affected areas until written instructions are received. If removal is required, payment will be made in accordance with the contract unit prices bid for each respective material. In the absence of unit prices, costs shall be negotiated or otherwise established prior to commencement of removal, in accordance with provisions of the Contract.

C. The Owner or Designer will work with the Contractor to initiate removal or encapsulation of the asbestos. An extension of the completion date may be granted equal to the time lost. Proper notification must be made to the MADEP through the ANF-001 form, and the Owner.

1.20 LIST OF DRAWINGS

A. All Drawings are included in Appendix A of this Project Manual.

1. T1 - Cover Sheet
2. A1 - Demo Partial Plans & New Construct. Plan, Partial Ramp Sections and Elevations
3. A2 - Sections and Details
4. E0 - Electrical Legend and Notes
5. E1 - New Lighting Partial Plan & Demo Partial Plan

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
01.11.00

SECTION 01.31.00

PROJECT MANAGEMENT AND COORDINATION

I. PART I - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 SUMMARY

A. The Contractor shall be solely responsible for the management, scheduling and sequencing of all work and inspections required to meet this deadline.

B. Description:

1. Coordinate scheduling, submittals, and work of the various trades and elements of the Work to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

2. Coordinate sequence of the Work to accommodate Partial (Beneficial) Occupancy.

C. Meetings:

1. In addition to progress meetings, hold coordination meetings and pre-installation conferences with personnel and Sub-Contractors to assure coordination of the Work. The coordination meetings are to be separate from the commissioning or commissioning meetings.

D. Coordination of Submittals:

1. Schedule and coordinate submittals.

2. Coordinate work of various trades having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

3. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other trades.

4. Contractor’s mark-up will be excluded from change orders caused by lack of coordination during design.

E. Commissioning:

1. Not applicable.

1.03 FIELD COORDINATION

A. Project scopes of limited complexity or limited utility installation will not require coordination drawings. The Contractor remains responsible for field coordinating the work of all trades, to see that it comes together without conflict or loss of functionality.

1. Where field coordination is performed, the Contractor shall advise the Designers of any conflict or field condition which results in the system being installed other than as designed.

2. In such instances, contractors are expected to propose alternative routes based on field conditions revealed through the performance of the demolition. Rerouting shall not be performed, however, until first approved by the Designers. No additional compensation will be due for field coordination efforts.

3. Where rerouting of utilities differently than designed creates a conflict with another trade, which was not forseen or properly coordinated between the contractors, the conflicting utility shall be revised at no expense to the Owner, to eliminate the conflict.

1.04 MEP COORDINATION DRAWINGS

A. Full drawings not required, but coordination shall occur between all contractors / trades.

II. PRODUCTS (Not Used)

III. EXECUTION (Not Used)

END OF SECTION
01.31.00

SECTION 01.32.00

CONSTRUCTION PROGRESS DOCUMENTATION

I. PART I - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 REQUIREMENTS INCLUDED

A. Procedures and requirements for submission and review of progress schedules and reports.

1.03 RELATED SECTIONS

A. Section 01.10.00 – SUMMARY

1. Project meetings.

B. Section 01.31.00 - PROJECT MANAGEMENT AND COORDINATION

1. Progress and coordination meetings.

C. Section 01.33.00 - SUBMITTAL REQUIREMENTS

1. Project reports.
2. Schedule of values.
3. Shop drawings, product data, and samples.

1.04 CONSTRUCTION SCHEDULE

A. Contractor shall prepare and submit for Designer and Owner's information, a Construction Schedule for the work of the project. Said schedule shall include sequencing of the project work and shall be submitted within 2 weeks of pre-construction meeting.

B. In addition, the Contractor shall prepare and submit at each project meeting, a two-week look-ahead schedule. The schedule shall identify:

1. Major elements of the work which were complete since the last project meeting, organized by room or by trade.

2. Major elements of the work to be performed in the next two weeks, to be able to track short-term conformance to the overall project schedule.

3. A projection of any upcoming required service interruption notices

1.05 CRITICAL PATH METHOD SCHEDULING

A. The Contractor remains responsible for identifying the critical path of all project activities and milestones, and will not be entitled to any additional compensation or any additional days related to Change Order work unless it can be demonstrated that latent conditions impact the critical path.

B. The critical path schedule shall be updated and resubmitted with each Application for Payment, and shall be

considered a prerequisite for payment.

C. Additional Requirements

1. Provide a list of every submittal of shop drawings, product data, samples and other submittals required by the contract, General Conditions, Supplementary Conditions and/or technical specifications of the construction contract. The list shall identify every long lead item required by the contract.

II. PRODUCTS (Not Used)

III. EXECUTION (Not Used)

END OF SECTION
01.32.00

SECTION 01.33.00

SUBMITTALS

I. PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 RELATED DOCUMENTS

A. This Section supplements the General Conditions.

B. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements

1.03 GENERAL PROCEDURES FOR SUBMITTALS

A. Timeliness - The Contractor shall transmit each submittal to the Architect sufficiently in advance of performing related work or other applicable activities so that the installation is not delayed by processing times, including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect in advance of the Work. Allow (14) calendar days for Architect's review.

B. Sequence - The Contractor shall transmit each submittal in a sequence which will not result in the Architect's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.

C. Contractor's Review and Approval - Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review by the Architect. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To", "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section, or Drawing No. to which the submittal refers, purpose (first submittal, resubmittal), description, remarks, distribution record, and signature of transmitter.

D. Architect's Action - The Architect will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:

1. Final Unrestricted Release: Where marked *"No Exceptions Taken"* the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.

2. Final-But-Restricted Release: When marked *"Note Markings*" or "Comments Attached" the Work may proceed provided it complies with the Architect's notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend on these compliances.

3. Returned for Re-submittal: When marked *"Resubmit"* or *"Rejected"* the Work covered by the submittal (such as purchasing, fabrication, delivery, or other activity) should not proceed. The submittal should be revised or a new submittal resubmitted without delay, in accordance with the Architect's notations stating the reasons for returning the submittal.

E. Processing - All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

1.04 OR EQUALS

A. Definition - Whenever a specification section names one or more brands for a given item, and the Contractor wishes to submit, for consideration, another brand, the submission shall be considered an "or-equal" or a "material substitution". For the purposes of this Contract, the terms "or-equal" and "material substitution" shall be considered synonymous.

B. In no case may an item be furnished on the Work other than the item named or described, unless the Architect, with the Owner's written concurrence, shall consider the item equal to the Item so named or described.

C. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Architect at the expense of the Contractor submitting the substitution.

1.05 SUBMISSION OF PRODUCT DATA

A. The Contractor shall submit an electronic copy of Product Data, in Adobe Acrobat (PDF) format to the Architect. All such data shall be specific and identification of material or equipment submitted shall be clearly marked or highlighted. Data of general nature will not be accepted.

B. Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not impair legibility.

C. Product Data returned by the Architect as *"Rejected"* shall be resubmitted until the Architects approval is obtained.

D. When the Product Data are acceptable, the Architect will stamp them *"No Exceptions Taken"*, and return 1 copy to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.

E. The Contractor shall maintain one full set of approved, original, Product Data at the site.

1.06 SUBMISSION OF SHOP DRAWINGS

A. Shop Drawings shall be complete, giving all information necessary or requested in the individual section of the specifications. They shall also show adjoining Work and details of connection thereto.

B. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.

C. The Architect reserves the right to review and approve shop drawings only after approval of related product data and samples.

D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Architect's stamp.

E. The Contractor shall submit to the Architect three (3) black line prints of each shop drawing or one electronic copy in Adobe Acrobat (pdf) format, at the Architect's discretion. Prints may be mailed, delivered in roll form or emailed. Each submittal shall be accompanied by a transmittal notice bearing the Contractor's approval stamp.

F. When the Architect returns a marked submittal with the stamp *"Resubmit*" or *"Confirm"*, the Contractor shall correct the original drawing or prepare a new drawing and resubmit three prints or an electronic version thereof to the Architect for approval. This procedure shall be repeated until the Architect's approval is obtained.

G. When the Architect returns submittal with the stamp *"No Exceptions Taken"*, the Contractor shall provide and distribute the prints for all Contractor and Subcontractors use.

H. The Contractor shall maintain one full set of approved shop drawings at the site.

1.07 SUBMISSION OF SAMPLES

A. Unless otherwise specified in the individual section, the Contractor shall submit two specimens of each sample to the owner.

B. A transmittal notice with the Contractors stamp of approval shall be included with all sample submittals.

C. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.

D. Samples that can be conveniently mailed shall be sent directly to the Architect, accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.

E. All other samples shall be delivered at the field office of the Project Representative with sample identification tag attached and properly filled in.

F. If a sample is rejected by the Architect, a new sample shall be resubmitted in the specified manner. This procedure shall be repeated until the Architect approves the sample.

G. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention is made in the specifications, at no additional cost to the Owner.

END OF SECTION
01.33.00

SECTION 01.50.00

TEMPORARY FACILITIES AND CONTROLS

I. PART I - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 REQUIREMENTS INCLUDED

A. Temporary Facilities and Controls including the following:

1. Temporary Water.
2. Weather Protection.
3. Heating During Construction.
4. Temporary Power.
5. Hoisting Equipment and Machinery.
6. Staging.
7. Maintenance of Access.
8. Dust Control.
9. Noise Control.
10. Indoor Air Quality (IAQ) Management.
11. Enclosures.
12. Cleaning During Construction.
13. Field Offices.
14. Telephone Service.
15. Sanitary Facilities.
16. Construction Barriers.
17. Parking.
18. Debris Control and Removal.
19. Safety Protection.
20. Vehicle and Equipment Protection.
21. Shoring.
22. Construction Fence.
23. Project Identification Sign.
24. Delivery of Materials.
25. Shut Down Notice.
26. Construction Cores.
27. Covered Walkways
28. Excavations and Field Survey Requirements

1.03 TEMPORARY WATER

A. Water available within the project area may be used by Contractors for construction purposes, provided it is not use wastefully. The Owner reserves the right to revoke this privilege is water is not used responsibly.

B. Connection to the building water supply shall be made from the adjacent boiler/mechanical room. Connection in the toilet rooms may be made with the Owner's approval, and provided hoses are protected and oriented so as to avoid trip hazards.

C. Contractors shall furnish their own hoses for temporary water. When water is not in use, hoses shall be disconnected, rolled up and stored out of the way of the occupants.

D. The General Contractor shall provide an adequate supply of drinking water from approved sources of acceptable quality, satisfactorily cooled, for his employees and those of his Subcontractors.

E. Use of the water may be discontinued by the Owner if, in their opinion, it is wastefully used.

1.04 WEATHER PROTECTION

A. Although the scope of work is intended to occur of Summer brake, the contractors are reminded that M.G.L. Chapter 149, Section 44D(G) requires that the General Contractor shall provide temporary enclosures and heat to permit construction work to be carried on during the months of November through March in compliance with M.G.L. Chapter 149, Section 44D(G) if required. Under no circumstances shall the General Contractor suspend any work during the months of November through March because of their reluctance to provide and pay for temporary weather protection. These Specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible to protect in the judgment of the Designer. Included in the preceding category, without limitation, are such items as site work, excavation, steel erection, erection of certain "exterior" wall panels, roofing, and similar operations.

B. "WEATHER PROTECTION" shall mean the temporary protection of that work adversely affected by moisture, wind, and cold, by covering, enclosing and/or heating. This protection shall provide adequate working areas during the months of November through March as determined by the Designer and consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The General Contractor shall furnish and install all "weather protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 50 degrees F. at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials or the applicable general conditions set forth in the Contract Articles with added regard to performance obligations of the General Contractor.

1. Within 30 calendar days after his award of contract, the General Contractor shall submit in writing to the Designer for approval, three copies of his proposed methods for "Weather Protection."
2. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices. Heating devices which may cause damage to finish surfaces shall not be used.
3. The General Contractor shall furnish and install one accurate Fahrenheit thermometer at each work area as designated by the Designer. However, one additional accurate Fahrenheit thermometer shall be provided for every 2,000 square feet of floor space where the work areas exceed 2,000 square feet.

1.05 HEATING DURING CONSTRUCTION

A. The heating system is not anticipated to be affected by this scope of work, therefore no temporary heat is anticipated.

B. The contractor shall furnish any local heating or ventilation as may be required for the curing or drying of the Work, if the building’s heating system is insufficient.

1.06 TEMPORARY POWER

A. Contractors may utilize electrical power where available in or around the Work Area, and the Owner shall pay the cost of electricity used.

1. The use of cordless tools is strongly encouraged.

2. Contractors shall provide their own electrical cords, and cords shall not be run through, across or draped within corridors or circulation spaces used by the public. If running electrical cords across circulation spaces is unavoidable, cords shall be secured to the floor with readily visible colored duct tape, and shall be removed as soon as power is no longer needed.

B. Modification of electrical panels is not permitted.

C. Generators for temporary power which cannot be provided through outlets within or around the project area, will be permitted.

1. Equip generators with mufflers or silencers and position outside the building, where directed by the Owner. If generator noise adversely affects building occupants, the Owner may ask for the location to be changed or the use of generators to be suspended.

2. Do not idle generators when power is not required for the work being performed.

1.07 MAINTENANCE OF ACCESS

A. The General Contractor shall maintain for the duration of his contract, a means of access to, around and within the site, as indicated on the Contract Drawings, for vehicular traffic and authorized personnel. Driveways and loading areas shall not be blocked by contractor's equipment, vehicles or dumpsters.

1.08 DUST CONTROL

A. The General Contractor shall provide adequate means for the purpose of preventing dust caused by construction operations from creating a hazard, nuisance, and from entering adjacent occupied areas throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the Contract Articles with added regard to performance obligations of the General Contractor.

1.09 NOISE CONTROL

A. Contractors shall anticipate limited use of the building by the Owner during the performance of the Work.

B. Work must be scheduled and performed in such a manner as to not interfere with the operations of the Owner. Construction work that is deemed by the Owner to be excessively noisy may be required to be done during non-normal working hours and at no additional expense.

C. Comply with requirements of authorities having jurisdiction. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

D. Execute construction work by methods and by use of equipment which will reduce excess noise.
1. Equip air compressors with silencers, and power equipment with mufflers.
2. Manage vehicular traffic and scheduling to reduce noise.
3. No heavy equipment may be started or idled before 7A.M.

1.10 INDOOR AIR QUALITY (IAQ) MANAGEMENT

A. Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke. At a minimum, take the following measures:
1. Prohibit smoking in the building.
2. Locate exterior designated smoking areas away from entries, outdoor air intakes, and operable windows.

B. During Construction:
1. Provide negative air machines, ducted to existing windows through polyethelyne ducting, to contain dust within the project area and exhaust it to the exterior. Locate exhaust away from doors and windows. Where windows are present above the exhaust location, check to ensure that they are closed.

C. Before Occupancy:

1. Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air."

1.11 ENCLOSURES

A. Provide temporary, insulated, weather tight closures of openings in exterior surfaces for providing acceptable working conditions and protection for materials, allowing for heating during construction, and preventing entry of unauthorized persons.

B. All utilities including electric ducts, conduits, telephone lines, sprinklers, and other utilities shall be protected against damage from construction activity. The General Contractor shall be responsible for all damage to the utilities from construction and shall repair all such damage at no additional cost to Owner.

C. Provide temporary partitions and/or ceiling as required to separate work areas from occupied areas, to prevent penetration of dust and moisture into occupied areas, to prevent damage to existing areas and equipment. Construction shall be framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces; (STC rating 35 in accordance with ASTM E900. Flame Spread Rating of 25 in accordance with ASTM E84.)

1.12 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

B. Control accumulation of waste materials and rubbish; periodically dispose of off-site in a legal manner. The General Contractor shall bear all costs, including fees resulting from such disposal.

C. Clean interior areas prior to start of finish work and maintain areas free of dust and other contaminants during finish operations.

D. Clean all dirt and debris tracked into other buildings by construction personnel, to the satisfaction of the Owner.

E. Maintain project in accordance with all local and Federal Regulatory Requirements.

F. Store volatile wastes in covered metal containers, and remove from premises.

G. Prevent accumulation of wastes which create hazardous conditions.

H. Provide adequate ventilation during use of volatile or noxious substances.

I. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
   1. Do not burn or bury rubbish and waste materials on site.
   2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3. Do not dispose of wastes into streams or waterways.
   4. Identify potential sources of cleaning water runoff and propose abatement procedures.

J. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

K. Use only those cleaning materials and methods recommended by manufacturer of surface materials to be cleaned.

L. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.

M. Provide on-site containers for collection of waste materials, debris, and rubbish.

N. Remove waste materials, debris and rubbish form the site periodically and dispose of at legal disposal dump site (DEP approved). Recycle where possible.

O. Handle material in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.

P. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.

1.13 FIELD OFFICES

A. Contractors may utilize space within the project area for a field office or the owner will provide usable space, outside of the project area, as field offices for the contractors.

B. At the Contractor's option and expense, and if permitted by the Owner, the General Contractor may provide a suitable field office on site for its own use. The office trailer shall be relocated if required by the Owner, and shall be secured to the site as required by the Building Code.

1.14 TELEPHONE SERVICE

A. All Designers, Superintendents and Project Managers shall maintain cellular telephones and be reachable Monday - Friday between 8AM and 5PM, and after hours for emergency calls. Phone numbers shall be listed on a Project Directory, to be submitted at the pre-construction meeting.

1.15 SANITARY FACILITIES

A. Use of toilet facilities within the building will be permitted, provided the Contractors maintain the facilities in clean condition. The General Contractor shall take responsibility for maintenance and cleaning of such areas and shall leave them in first class condition equal to the accepted conditions of toilet facilities not used for construction personnel. Location to be confirmed by the owner. Abuse or improper cleaning will result in the Contractor not being able to use the toilet facilities.

1.16 CONSTRUCTION BARRIERS

A. Proper construction barriers shall be provided around the contract work areas as defined by the Contract Drawings or as directed by the Owner.

B. Construction barriers shall consist of traffic cones, ribbons, tapes, secure fencing, trench covers, wood barriers, warning signs, directional signs, and other traffic materials to keep traffic and people from area of construction and maintain ongoing operations.

C. Barriers shall be erected at such approved locations as are necessary, sufficiently cross-braced and supported adequately from floors and ceilings as required.

1.17 PARKING

A. Parking will be permitted within the school's parking lot, where directed by the Owner. Contractors shall move vehicles when requested by the Owner.
   1. Access to loading docks, driveways, staff, faculty, visitor or tenant parking shall not be blocked by construction vehicles.
   2. Parking in handicapped accessible spaces will not be permitted.

B. Idling of vehicles on site will not be permitted.

C. If the Owner authorizes parking on lawns, the Prime Contractor shall be responsible for repairing any damage to lawns or curbs from parked vehicles.

1.18 DEBRIS CONTROL AND REMOVAL

A. Debris shall not be permitted to accumulate or migrate and the work shall at all times be kept satisfactorily clean. Facility trash receptors shall not be used for the disposal of debris. Dumpster shall be provided by the General Contractor for removal of debris for all Subcontractors.

B. Remove debris from the work site on a daily basis and dispose of same at any (private or public) DEP approved dump that the General Contractor may choose providing that the General Contractor shall make all arrangements and obtain all approvals and permits necessary from the owner or officials in charge of such dumps. During disposal process, copies of daily receipts from dump site shall be submitted on a regular basis.

1.19 SAFETY PROTECTION

A. At no time shall the work be left unattended without proper safety protection and shall not be left unprotected to the weather and accessible to the public. It is the responsibility of the General Contractor to maintain proper safety protection for the public while work is in progress or unattended.

1.20 VEHICLE AND EQUIPMENT PROTECTION

A. All construction activities shall be performed in such a manner so as not to dust, stain or damage any building elements, equipment, vehicles, etc. within general vicinity of the construction work area. Any damage to these items shall be cleaned and repaired at the expense of the General Contractor.

1. All construction vehicles and equipment on site shall be effectively disabled and secured when not in use.

1.21 CONSTRUCTION / TEMPORARY FENCE

A. The General Contractor shall provide temporary construction fence around the project area as required to secure the projects sites, until project completion.

1.22 PROJECT IDENTIFICATION

A. No project sign is required by the Owner.

B. If the Contractor wishes to provide a project sign, at his own expense, the Owner reserves the right to approve the content and appearance of the sign.

C. Any signs will be located on site where directed by the Owner, and shall be relocated or removed if the Owner so directs.

1.23 DELIVERY OF MATERIALS

A. All Materials shall be delivered to the Contractor's or Sub-Contractor's warehouse or may be delivered to the site if the Contractor's representative is present to receive them.

B. No materials will be received by the Owner's personnel.

1.24 SHUT DOWN NOTICE

A. The Contractor shall notify the Owner, at least fourteen (14) calendar days in advance, of the need for any utility shut down to install or modify any utilities or building systems. The shutdown request shall indicate:
1. The utility to be shutdown.
2. The duration of the shutdown.
3. The spaces anticipated to be affected by the shutdown.

B. Investigation of the existing systems to determine the areas served, the location of isolation valves or sub-panels, etc., is to be anticipated and included in the bid scope.

C. Shutdowns involving sprinkler systems or fire alarm systems, for which the Authority Having Jurisdiction (AHJ) or WPS requires a fire watch, the contractor performing the shutdown shall provide and pay for the fire watch at no additional cost to the Owner.

D. Utility shutdowns affecting other buildings will be limited to occur after normal working hours. No additional compensation will be paid for overtime.

1.25 EXCAVATIONS AND FIELD SURVEY REQUIREMENTS

A. Not applicable.

II. PART II - PRODUCTS (Not Used)

III. PART III - EXECUTION (Not Used)

END OF SECTION
01.50.00

SECTION 01.73.29

CUTTING AND PATCHING

I. PART-1 GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.02 SCOPE OF WORK

A. The General Contractor shall coordinate the work to ensure that all embedded or concealed items are placed prior to the closing of construction. Where opening up construction is required to install any aspect of the work, the General Contractor shall be solely responsible for the cutting and patching of such materials.

1.03 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Obtain approval of the cutting and patching proposal from the Designer before cutting and patching structural elements.

C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

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

1.05 RELATED SECTIONS

A. Section 4.13 - General Conditions of the Contract, Article 3.

II. PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

B. Concrete, where used to spot patch abandoned penetrations in floors, shall be:

1. Normal weight concrete proportioned in accordance with ACI 211.1 and ACI 30 for 4,000 psi compressive strength @ 28 days.

2. At openings over 6" wide, provide ASTM A 615/A 615M, Grade 60, deformed reinforcing bars doweled into to the existing slab 48" on center, both sides, staggered.

3. At horizontal openings less than 6" wide, chip out the top of the opening to enlarge it, creating a tapered or conical hole to patch, such that the patch material cannot drop trough the hole.

C. Grout, where used to close annular space around floor or wall penetrations, shall be:

1. non-shrink type, prepackage and preproportioned, requiring only the addition of potable water before use, meeting or exceeding the following standards:
   (a) General Properties: ASTM C 1107-02
   (b) Compressive strength: ASTM C 109
   (c) Bond Strength: ASTM C 882

D. Lumber: where cutting of lumber is required for the installation of utilities or recessed items, or for the incidental replacement of damaged or unsuitable framing materials, new materials used to patch, sister, header or box out openings shall be kiln dried, stud grade S-P-F dimensional lumber with a dressed size of 1½" x the depth of the members receiving the work.

1. Use pressure treated lumber when in contact with ground, masonry, concrete or for roof blocking, with CCA preservative and a minimum retention rate of 0.25 pcf. Treat all cut ends by touching up in field with preservative. Use only galvanized fasteners and separate from materials which will react with preservative by using a separation sheet of peel-and-stick bituminous flashing tape.

III. PART 3 - EXECUTION

3.01 PROTECTION

A. Protect existing trees, plants, roads, walls etc. to remain. Special protection of any lawns and planting around buildings is the responsibility of the Contractor. Contractor will replace any planting killed or damaged by construction operations.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

2. Take all precautions necessary to avoid cutting existing pipe, conduit or duct work serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

C. Furnish drop cloths, erect dust partitions and take other measures as required to control dust generated by cutting activities and prevent its spread to adjacent areas

3.03 PERFORMANCE

A. The General Contractor shall be responsible for all cutting and patching, including all cutting and patching required by sub contractors.

1. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

2. Before proceeding, meet at the 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.

B. Firestopping, where required, shall be performed by the trade penetrating the wall, floor or ceiling. At all other areas requiring firestopping, work shall be performed by the General Contractor. Any parties performing firestopping work shall be certified by the firestopping manufacturer.

C. General: Employ skilled workmen to perform cutting and patching. Where required to maintain an existing product or system warranty, such as a roof warranty, employ a manufacturer's approved and warranted Contractor to perform the cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

D. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

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

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or diamond core drill.

E. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. 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.

2. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

3. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat. Touch-up painting may stop at a corner, pilaster or other visual break in the repaired surface.

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

F. Site Repair:

1. Restore all lawns, plantings, trees to their original condition.

2. Repair all walkways and driveways that were damaged due to construction.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature.

B. Clean any portions of the building which were affected by dirt or dust generated by cutting, sanding or other construction activities.

END OF SECTION
01.73.29

SECTION 01.77.00

CLOSEOUT PROCEDURES

I. PART 1 - GENERAL

1.01 GENERAL

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. This section lists the procedures required for the proper completion of this project including processing the Release of Retainage and making the Final Payment to the Contractor.

B. Consult the Individual sections of the specifications for requirements affecting Project Close Out.

1.03 RELATED DOCUMENTS

A. This section supplements the General Conditions.

B. Consult the individual sections of the specifications for specific items required under those sections.

1.04 SUBSTANTIAL COMPLETION

A. Prior to requesting Substantial Completion the Contractor shall make a thorough inspection of the Work. During this inspection the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.

B. Upon completion of the items noted on the Contractor's list the Contractor shall notify the Architect that the Work is Substantially Complete. The Architect shall then conduct a similar thorough inspection. If the Architect agrees that the Work is Substantially Complete, the Architect will promptly make a thorough inspection and prepare a punch list, setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.

C. The Contractor shall not be relieved of the responsibility to provide Contract items left off of the Architect's punch list.

D. If the Architect determines that the Work is not Substantially Complete, the Architect shall inform the Contractor of those items that must be completed before the Architect will prepare a punch list. Upon completion of those items, the Contractor shall again request the Architect to prepare a punch list.

E. When the punch list has been prepared, the Architect will arrange a meeting with the Contractor and Subcontractors to identify and explain all punch list items and answer questions on work which must be done before final acceptance.

F. The Architect may revise the punch list, from time to time, to ensure that all items of Work are properly completed.

G. The Architect shall prepare the Certificate of Substantial Completion in accordance with the General Conditions.

H. The Contractors shall correct the items noted on the punchlist(s). The General Contractor shall check the

work of his forces, and of all sub-contractors to verify that the work has been corrected, and notify the architect that the project is ready for reinspection. The Architect and Engineers may, at their discretion, check the work to confirm the punchlist has been completed, and advise the Owner.

1. If the Contractor calls for reinspection, and the Project is not actually ready or punchlist items have not been corrected and subsequent re-inspections are required, the Architect reserves the right to bill the Owner for the re-inspections, and such monies will be deducted from the balance due to the Contractor.

1.05 RECORD DRAWINGS

A. As-built Drawings shall consist of all the Contract Drawings. As-built Drawings shall be kept up-to-date. Information from on-going Work shall be recorded on As-built Drawings within 48 hours of Work being performed.

B. The General Contractor and each Subcontractor shall be required to maintain one set of As-built Drawings, as the work relates to their Sections of the Specifications, at the site.

C. The As-built Drawings shall be stored and maintained in the General Contractor's field office or a secure location apart from other documents used for construction. The As-built Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. As-built Drawings, as submitted by the General Contractor shall be verified in the field by the Designer or his Consultants. Verification by the Designer shall occur during the construction process and prior to the related work being completed and covered up.

E. The As-built Drawings shall be available at all time for inspection by the Project Manager or Designer. All deficiencies noted shall be promptly corrected.

F. At the end of each month and before payment for materials installed, the General Contractor, each Subcontractor, the Architect and Project Manager shall review the As-built Drawings for purpose of payment.

1. If the changes in location of all installed elements are not shown on the As-Built Drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

G. Prior to the installation of all finish materials, a review of the As-built Drawings shall be made to confirm that all changes have been recorded. All costs to investigate such conditions shall be borne by the applicable party as determined by the Designer.

H. At the completion of the contract, each Subcontractor shall submit to the General Contractor a complete set of his respective As-built Drawings indicating all changes. After checking the above drawings, the General Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the As-built Drawings to the Designer.

I. The original hand-noted as-Built Drawings shall be scanned in color to Adobe Acrobat (*.pdf) format and submitted on CD or USB Drive to the Designer, to be added to the complete plans as constructed.

1.06 RECORD SURVEYS

A. **Once the ramp is complete, the General Contractor shall hire a third party company survey all components of the ramp to confirm that all MAAB and ADA slope requirements are met and issue a certified plan for WPS' records. If any portions of the ramp do not meet the requirements, they will need to be corrected and / or removed and replaced and the entire ramp will need to be re-survey to prove that it now meets all accessible requirements. This process will be repeated until all requirements are met.**

1.07 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Consult the individual sections of the specifications for the specific requirements for those sections and for further details and descriptions of the requirements.

B. Prior to final payment and completion the Contractor shall provide all Operating Manuals and Maintenance Instructions as required by the Contract Documents.

C. Operating Instructions and Manuals:

1. Subcontractors, installers, and suppliers shall furnish to the Contractor two sets of operating and maintenance instructions of all mechanical, electrical, and manually operated equipment furnished and installed by them. Mechanical and electrical subcontractors shall furnish instructions as specified in their respective sections.

2. The Contractor shall collect all of the above instructions, bind them into two complete sets, and submit them to the Architect who will deliver them to the Owner.

3. The Contractor shall prepare a CD / USB drive of all O&M items and deliver to the Owner.

4. Submission of operating and maintenance instructions shall be a condition precedent to final payment

D. Instruction of Owner's Personnel

1. Where specified in the individual sections of the specifications, the Contractor and Subcontractor shall instruct the Owner's personnel at the site, in the use and maintenance of equipment installed under the Contract.

2. Submission to the Architect of a certificate of compliance to this requirement, signed by the Contractor and the Owner's Representative, shall be a condition precedent to final payment.

1.08 PARTIAL RELEASE OF RETAINAGE

A. If within 65 days after Substantial Completion, any of the items on the Architect's punch list are not complete or if the Contractor has not provided the appropriate marked up As Built Drawings, Operating Manuals, Warranties, Guarantees, or Spare Parts the Architect shall assign a monetary value for each incomplete item as well as any other items as provided by M.G.L. c.30 §39K, and the Architect shall prepare a Certificate for Partial Release of Retainage

B. If the Architect is required to prepare a Certificate for Partial Release of Retainage the Contractor shall complete all remaining Work in accordance with the provisions of the General Conditions.

C. The Contractor's signature on this Certificate shall be notarized.

D. The Contractor may make a request for additional releases of retainage when portions of the Work listed on the Architect's punch list have been satisfactorily completed. Each request shall be accompanied by a new application for payment and a new signed and notarized Certificate for Partial Release of Retainage.

E. The Architect's inspections, required to complete the additional payment applications described above, are subject to provisions of the General Conditions.

F. If the Owner has required Performance and Payment Bonds, then prior to the partial release of retainage, the General Contractor shall submit to the Owner Consent of Surety to Partial Release of Retainage using AIA Document G707A or an equivalent document.

1.09 FINAL RELEASE OF RETAINAGE

A. Prior to the final release of retainage, the General Contractor shall submit to the Owner:

1. Consent of Surety, using AIA Document G707 or similar document, if performance and payment

bonds were required for the project.

2. Contractor's Affidavit of Release of Liens, using AIA Document G706A or equivalent. This document shall be accompanied by certified statements from all sub-contractors working on the project, that they have received all monies due, and have paid all suppliers and sub-sub contractors accordingly.

   (a) Should any payments be outstanding and contingent upon receipt of the retainage in order to be paid, the General Contractor shall submit AIA Document 706, itemizing those items which have not been paid.

END OF SECTION
01.77.00

SECTION 02.08.10

DISTURBANCE OF LEAD, CADMIUM, & CHROMIUM MATERIALS

PART I - GENERAL

1.01 GENERAL REQUIREMENTS

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

B. The Owner shall not incur any additional costs due to negligence or regulatory requirements imposed upon this project due to the Contractor failing to abide by the requirements of the specifications and applicable regulations.

1.02 DEFINITIONS

A. Site: Refers to the Fanning Building located at 24 Chatham Street, Worcester, Massachusetts as outlined by contract documents and drawing**s.**

B. Owner: Refers to Worcester Public Schools and their designated, authorized personnel.

C. Architect: Refers Nault Architects Inc., 71 Hope Avenue, Worcester, Massachusetts and their designated, authorized personnel.

D. Consultant: Refers to ATLAS Technical Consultant, LLC (ATLAS), 73 William Franks Drive, West Springfield, Massachusetts and their designated, authorized personnel.

E. Asbestos Abatement Contractor: Refers to the Contractor who has been awarded the Contract for performance of asbestos abatement work as outlined by this Section.

1.03 DESCRIPTION OF WORK

A. The Contractor shall be made aware that lead, cadmium and chromium is present within painted substrates or within building components throughout the sites which will be impacted by renovation and demolition activities on this project.

B. The Contractor shall be required to comply with all aspects of the Occupational Safety and Health Administration (OSHA) Regulations pertaining to lead, cadmium and chromium with regards to disturbance of these materials when performing their work.

C. It shall be the sole responsibility of the Contractor for compliance with this Section, including all costs associated with, but not limited to:

- Compliance with OSHA 29 CFR 1926.62 Lead Regulations.
- Compliance with OSHA 29 CFR 1926.1127 Cadmium Regulations.
- Compliance with OSHA 29 CFR 1926.1126 Chromium Regulations.
- Development and implementation of a Compliance Program.
- Development and implementation of a Respiratory Program.
- Development and implementation of a Medical Monitoring Program.
- Development and implementation of a Hazard Communication Program.

- Performance of any lead, cadmium or chromium testing required on the project.
- Performance of any Negative Exposure Assessments required.
- Providing all medical examinations required.
- Providing all equipment required (Including appropriate PPE)
- Providing all engineering controls and associated work practices.
- Disposing of all demolition material in accordance with local, state and federal regulations

D. Due to the age of the building and previous painting history, the Contractor shall assume any paint surfaces to contain lead, cadmium and chromium and comply with this Section and OSHA Regulations accordingly. In addition, building components such as pipe sleeves, conduit, electrical equipment, etc. may also contain lead, cadmium or chromium that will require compliance with this Section. The Contractor, at their own discretion may elect to perform testing to confirm the presence of lead, cadmium and chromium in the building. However, all costs associated with additional testing and compliance with this Section shall be borne by the Contractor under the Base Bid.

E. It should be noted that abatement of the paint by a licensed Lead Abatement Contractor shall not be required for performance of the renovation or demolition work outlined under this Contract. The building is not considered a residence where children under the age of six (6) reside, therefore, abatement of lead-containing components will not be required as per Massachusetts Department of Public Health (DPH) "Child Lead Poisoning and Prevention Regulations.

F. If the Contractor deems that removal of the lead, cadmium or chromium will be an appropriate "engineering control" for compliance with their OSHA programs, then such removal shall be performed at the Contractor's own expense in accordance with applicable requirements. No additional compensation shall be granted for any engineering control methods employed by the Contractor for compliance with this Section, OSHA or other applicable requirements. In addition, all costs associated with removal of paint to meet compliance with applicable construction standards (i.e. welding, torch cutting, grinding, etc.) shall be the responsibility of the Contractor under the Base Bid.

G. OSHA regulates activities that disturb lead, cadmium and chromium by the use of manual techniques. Regulated activities include abrasive blasting, welding, and cutting, burning on structures, manual scraping or sanding, and manual demolition of structures or components. The work practices described in this Section are intended to adequately protect the workers from exposure to lead, cadmium and chromium, provide a safe workplace, and protect the environment. However, it shall be the Contractors responsibility to comply with this Section as well as any other provisions/requirements outlined by OSHA and other applicable regulations.

H. Materials and Equipment: The work of this Section, without limiting the generality thereof, includes the furnishing of labor, materials, tools, equipment, services and incidentals necessary to safely accomplish tasks which will disturb lead, cadmium and chromium.

I. Approvals and Inspections: Temporary facilities, work procedures, equipment, materials, services, and agreements must fully comply with EPA, OSHA, and NIOSH recommendations, standards and guidelines, as well as any other applicable federal, state, and local regulations. Where there exists an overlap of these regulations and guidelines, the most stringent shall

apply.

J. Disposal: The Contractor shall dispose of demolition debris and associated materials in accordance with Part 3.06 of this Section.

1.04 SITE WORK DEFINITIONS

A. Action Level: Action Level as defined by OSHA shall refer to employee exposure, without regard to the use of respirators, to an airborne concentration of lead, cadmium or chromium calculated as an 8-hour time-weighted average (TWA).

B. Competent Person: Competent Person shall refer to a person who is capable of identifying existing and predictable hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.

C. HEPA Filter: HEPA Filter shall refer to a filter capable of filtering out monodispersive particles of 0.3 microns or greater diameter from a body of air at 99.97 percent efficiency or greater.

D. Lead, Cadmium and Chromium Paint: Shall refer to paint found to contain lead, cadmium and chromium in any concentration or paint assumed to contain lead, cadmium and chromium as indicated in this Section.

E. Permissible Exposure Limit (PEL): PEL shall refer to employee exposure, without regard to the use of respirators, to an airborne concentration of lead, cadmium or chromium calculated as an 8 hour time-weighted average.

1.05 PERMITS AND INSPECTIONS

A. Notifications/Approvals: The Contractor shall make, in proper and timely fashion, any necessary notifications to relevant Federal, State, and local authorities and shall obtain and comply with the provisions of all permits or applications required by the work specified, as well as make all required submittals required under those auspices. The Contractor shall indemnify the Owner, their representatives and agents from, and pay for claims resulting from failure to adhere to these provisions. The costs for permits, applications, and the like, are to be assumed by the Contractor.

B. Fees, Permits and Licenses: The Contractor shall pay licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing the performance of the job specified in this Section. The Contractor shall be solely responsible for costs, damages or losses resulting from any infringement of these patent rights or copyrights. The Contractor shall hold the Owner, Architect and Consultant harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights. If the Specification requests the use of any product, design, invention, or process that requires a licensing fee or royalty fee for use in the performance of the job, the Contractor shall be responsible for the fee or royalty and shall disclose the existence of such rights.

C. Contractor shall be responsible for costs for licensing requirements and notification requirements and other fees related to the ability to perform the work in this Section. The Contractor shall be responsible for securing necessary permits for work under this Section,

including removal, materials usage, or any other permits required to perform the specified work.

1.06 SUBMITTALS

A. Pre-Construction Submittals: Prior to the commencement of the required work, the Contractor shall provide the following to the Architect for approval:

- A written description detailing the means and methods to achieve compliance with the OSHA standards as well as the provisions outlined herein.
- A written description detailing the means and methods for properly disposing of all demolition debris in accordance with local, state and federal regulations.

B. Post-Construction Submittals: Final payment to the Contractor shall not be made unless the following items are submitted to the Architect for approval:

- Original Copy of Waste Disposal Manifests acknowledging disposal of any hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.

1.07 QUALITY CONTROL/ASSURANCE

A. Training Requirements: Workers who will have the potential of lead, cadmium and chromium exposure shall have proof of successfully completing a training course which covers the topics required by OSHA. Contractors are also advised that training in other areas may be required by OSHA and are responsible to ensure that all training requirements for appropriate trades and procedures are met.

B. Specified Supervisor Qualifications: The Contractor shall specify an on-site Supervisor or Competent Person who is fully qualified in all aspects of safe work practices and procedures, and have (or will have) completed a training course within the previous year prior to the commencement of the work. The training course will cover all topics required by OSHA as well as training in relevant federal, state and local regulatory requirements, procedures and standards, supervisory techniques, and proper disposal procedures.

C. Site Specific Written Compliance Program: The program will be evaluated to ensure the elements required by OSHA are specific to the conditions at the job site.

D. Respiratory Protection Program: The Contractor must provide for review a written respiratory protection program in accordance with 29 CFR 1920.103 if respiratory protection is to be worn during this project.

E. Fit Test Records: If respiratory protection is to be worn as part of this project, records of successful respirator fit testing performed by a qualified individual within the previous 12 months, for each employee to be used on this project with the employee's name and social security number with each record.

F. Medical Surveillance: The Contractor shall provide biological monitoring to workers who have the potential of lead, cadmium and chromium exposure. This monitoring shall be performed in accordance with OSHA. If workers are expected to exceed the action level for more than 30 days in any consecutive 12 months the Contractor shall institute a medical

surveillance program in accordance with OSHA. A laboratory approved by OSHA shall conduct Blood level sampling and analysis.

1.08 CODES AND STANDARDS

A. Work shall conform to the standards set by applicable federal, state and local laws, regulations, ordinances, and guidelines in such form in which they exist at the time of the work on the contract and as may be required by subsequent regulations.

B. In addition to any detailed requirements of the Specification, the Contractor shall at his own cost and expense comply with all laws, ordinances, rules and regulations of federal, state, regional and local authorities regarding handling and storing of waste material.

NOTE: Regulations by the above and other governing agencies in their most current version are applicable throughout this project. Where there is a conflict between this Specification and the cited federal, state or local regulations or guidelines, the more restrictive or stringent requirements shall prevail. This Section refers to many requirements found in these references, but in no way is it intended to cite or reiterate all provisions therein or elsewhere. It is the Contractor's responsibility to know, understand, and abide by all such regulations, guidelines and common practices.

PART 2.0 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The Contractor shall be responsible for providing all material and protective equipment required for performance of the work. The Contractor shall comply with all local, state and federal regulations pertaining to the selection and use of materials and equipment on this project. The Contractor shall provide a submittal on all materials and equipment to be used for review and approval by the Designer.

PART 3.0 - EXECUTION

3.01 WORKER PROTECTION

A. Initial Determination: The Contractor shall determine, through personal exposure monitoring on the job site or through relevant documentation from other similar jobs, whether workers will be exposed to airborne lead, cadmium or chromium at or above the OSHA Action Level and Permissible Exposure Limit. If exposures at or above the action level are documented, appropriate health and safety procedures identified herein shall be followed. If levels below the action level are documented, the Contractor shall exercise an appropriate level of care to ensure that exposures above the action level do not occur. Whenever there is a chance of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead, cadmium or chromium at or at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the Contractor shall conduct additional monitoring.

Note: The Contractor shall be responsible for performing a negative exposure assessment on each trade subject to the OSHA Regulation. The assessment shall take place during routine work activities, which will simulate employees, actual exposure

levels to lead, cadmium and chromium. All assessments shall take place over an 8-hour time period and shall include all appropriate PPE and biological monitoring required as stated herein.

B. Personal Hygiene Practices: Where exposures to airborne lead, cadmium and chromium above the OSHA PEL occurs or may be expected to occur, the Contractor shall enforce and follow good personal hygiene practices. These practices shall be performed until personal exposure sampling indicates that exposures are below the PEL at which time the Contractor has the option to continue or discontinue the use of personal hygiene facilities. These practices shall l include but not be limited to the following:

1. No eating, drinking, smoking, or applying cosmetics in work area. The Contractor will provide a clean space, separated from the work area, for these activities.
2. Workers must wash upon leaving the work area. The Contractor will provide wash facilities. This wash facility will consist of, at least, running potable water, towels, and a HEPA vacuum. Upon leaving the work area, each worker will remove and dispose of work suit, wash and dry face and hands, and vacuum clothes.
3. Disposable clothing, such as TYVEK suits, and other personal protective equipment (PPE) must be donned prior to entering work area. A clean room will be provided for workers to put on suits and other personal protective equipment and to store their street clothes. Disposable suits shall be used once, then properly discarded.
4. A lavatory facility must be provided and located adjacent to the work area. The eating and drinking area, clean room, and the lavatory facility must be maintained in a clean and orderly fashion at all times. The Contractor will provide portable lavatories when needed and disinfect them daily.
5. If air-monitoring data gathered by the Contractor shows that employees' exposure to airborne lead, cadmium or chromium exceeds the PEL, the following conditions apply:

    a. Showers must be provided. Shower water must pass through at least a 5.0 micron filter before returning to the public waste system.
    b. Workers must shower upon leaving work area.
    c. Three-stage decontamination unit must be established consisting of an Equipment Room, Shower, and Clean Room in series.

3.02 WORK AREA SET UP

A. Site Safety: The Contractor is responsible for all safety at the work site. This includes, but is not limited to, electrical safety, mechanical (tool) safety, fire safety, and personnel protective safety. Safety requirements are, for the most part, common sense and sound business practice; however, the Contractor is advised that federal, state, and local regulations exist which govern safety on the work site. Therefore, in addition to the following, the Contractor is responsible for adhering to the most stringent requirements in effect.

B. Signage: Prior to the preparation for work which will disturb lead, cadmium or chromium, the Contractor shall place warning signs immediately outside all entrances and exists to the area, warning that lead, cadmium and chromium work is being conducted in the vicinity. The signs shall be at least 20" x 14" and read:

WARNING:
LEAD, CADMIUM, CHROMIUM WORK AREA
POISON

NO SMOKING, EATING OR DRINKING
ALLOWED IN THE WORK AREA

The signs shall be in bold lettering with lettering not smaller than two inches tall. Should personal exposure monitoring results indicate that exposures are below the Action Level, then the signs will not be required.

C. Access to Work Areas: It will be the Contractor's responsibility to allow only authorized personnel into the work area. Barrier tape shall be used to limit access to the exterior work area. Contractor shall maintain a bound logbook, in which any person entering or leaving the work area must sign and enter the dates and times of entry and departure. Should personal exposure results indicate the exposures are below the Action Level, then a logbook will not be required. The Contractor or competent person will not allow anyone access to the work area unless they have successfully passed an approved training program, and have been fitted and wearing a properly fitted respirator.

D. Dumpsters used to store hazardous waste shall be DOT approved, solid enclosed containers and locked and secured at all times.

E. Containment controls (including critical barriers, protective coverings, HEPA-filtered ventilation and decontamination facilities) may be required for renovation/demolition work. The degree of containment shall be appropriate for the anticipated levels of airborne dust. The lower the level of airborne dust, the lesser the requirements necessary to control lead, cadmium and chromium emissions at the job site.

F. The Contractor shall isolate work areas for the duration of work by completely sealing off all openings in the work area. Isolation scaling shall be accomplished by constructing critical barriers where necessary around the work area perimeter. The work area shall be sealed airtight to the greatest extent possible.

G. The Contractor shall erect one or more Decontamination Facilities (if applicable) to serve each work area. The facility will consist of series of two or more connected chambers including, at a minimum, a clean room and a shower/wash room, separated by an air lock. Unless otherwise specified, the shower/wash room shall be contiguous to the work area. Non-contiguous, remote, three-chamber decontamination facilities may be substituted with the Consultant’s prior written approval. Three-chamber decontamination facilities shall include an equipment room to be used for removal and temporary storage of contaminated worker clothing, equipment, and other items leaving the work area, prior to decontamination in the shower/wash room of the decontamination facility. In all cases, non-emergency access between contaminated and uncontaminated rooms or areas shall only be through the Decontamination Facility/Wash Room.

H. Ensure that barriers and linings are effectively sealed and taped at all times, and that the Shower/Wash Room floor is completely watertight. Repair damaged barriers, and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning of each work period.

I. All renovation/demolition work areas shall remain isolated from all other trades on the project and remain inaccessible to the public. Contractor shall monitor the access to the renovation/demolition work areas. The below listed items are required to control the generation of lead, cadmium and chromium containing dust during renovation/demolition activities if

worker exposure is above the PEL. The Contractor is ultimately responsible for cleaning all generated dust and debris from renovation/demolition operations and must maintain work areas free from dust generated from renovation/demolition activities.

1. Signs shall be posted at all approaches to the work area warning that work involving lead is being conducted in the vicinity. Signs shall be in bold lettering not smaller than two inches tall.
2. Barriers shall not be removed until the work areas are thoroughly cleaned and approved by the Consultant.

3.03 WORK PROCEDURES

A. The Contractor shall initiate, and continue, sufficient engineering and work practice controls, as described in the Contractor's Compliance Programs, to reduce and maintain worker exposures to lead, cadmium and chromium at or below the Action Level or Permissible Exposure Limit.

B. The following work practices are specifically required by these specifications:

1. All persons except those directly involved in the work shall be excluded from the work area. Physical barriers shall be used, where necessary, to limit access to the work area for the duration of the renovation activities. (Warning signs may need to be posted in accordance with applicable regulations.)
2. Provide hand washing facilities and assure that all workers thoroughly wash their hands and face upon exiting the work area. Workers shall pay careful attention to cleanse the hands and face when decontaminating (Provide hygiene facilities, including shower, as required based on initial assessment and continued monitoring.)
3. Thoroughly wet the areas to be demolished and mist the air to reduce the potential for creating airborne lead, cadmium and chromium dust.
4. All equipment used by the workers inside the work area shall be either left in the work area or thoroughly decontaminated before being removed from the area. Extra work clothing (in addition to the disposable suits supplied by the Contractor) shall be left in the clean area until the completion of work in that area. The clean area shall be cleaned of all visible debris and disposable materials daily.
5. Under no circumstances shall workers or supervisory personnel eat, drink, smoke, chew gum, or chew tobacco in the work area; to do so shall be grounds for the Engineer to stop all demolition operations. Only in the case of life threatening emergency shall workers or supervisory personnel be allowed to remove their protective respirators, if applicable, while in the work area. In this situation, respirators are to be removed for as short a duration as possible.
6. Feasible engineering controls shall be implemented by the Contractor to minimize the possibility of contamination of areas adjacent to the work area. The following activities are the minimum requirements of this section and affect the renovation/demolition performed on the project:

    a. No torch cutting, mechanical sanding or stripping or abrasive methods of paint removal shall occur.
    b. No renovation/demolition activities may occur which increase the workers exposure above the Action Level or Permissible Exposure Limit as described under OSHA.

7. Workers shall be informed of the components to be impacted during renovation/demolition that are identified as containing lead, cadmium and chromium.
8. Separation of Trades: Unprotected, untrained workers or trades shall not perform any related work within the same areas as demolition involving components identified as containing lead, cadmium and chromium. Other trades may not enter these areas until clean-up procedures are completed.

3.04 AIR SAMPLING – CONTRACTOR

A. Personal Exposure Monitoring: The Contractor shall perform personal exposure sampling to monitor personal exposure levels to airborne lead, cadmium and chromium. Samples shall be taken for the duration of the work shift or for eight hours, whichever is greater. Personal samples need not be taken every day after the first day if working conditions remain unchanged, but must be taken every time there is a change in the removal operation, either in terms of the location or the type of work. Sampling will be used to determine eight-hour Time-Weighted-Averages (TWA). The Contractor is responsible for personal sampling as outlined in the OSHA Standards.

B. Frequency: Air monitoring frequency will be established in accordance with the requirements set forth the OSHA Standards.

3.05 CLEAN-UP PROCEDURES

A. When work is in progress, the work site shall be cleaned at end of each day's activities. The building shall be secured to prevent entry by any person after termination of workday. Durable equipment, such as power and hand tools, generators, and vehicles shall be cleaned monthly.

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

3.06 DISPOSAL OF WASTE MATERIAL

A. General:

All costs associated with proper disposal of the waste materials (whether hazardous, non-hazardous or regulated) shall be borne by the Contractor under the Base Bid. All materials, whether hazardous, non-hazardous or regulated shall be disposed of in accordance with all laws, and the provisions of this Section and any or all other applicable federal, state county or local regulations and guidelines. It shall be the sole responsibility of the Contractor to assure compliance with all laws and regulations relating to disposal.

B. Non-Hazardous Materials: The Contractor shall contact the regional EPA, State and local authorities to determine disposal requirements for construction and demolition debris that contains lead, cadmium or chromium (non-hazardous). The Contractor shall be responsible for providing all dumpsters/containers required for collection and disposal of such material as well as disposal in an approved landfill.

C. Hazardous Waste/Regulated Materials: All materials which are determined to be hazardous

waste or regulated waste for lead, cadmium or chromium shall be disposed of by the Contractor as specified herein. The Contractor shall perform representative Toxicity Characteristic Leaching Procedure (TCLP) tests of demolition debris to ensure the material is properly profiled for disposal. This shall also include all testing required by the disposal or recycling facility. All costs associated with TCLP testing to profile the waste material shall be borne by the Contractor. If the material is found to be hazardous waste or regulated waste, the Contractor shall provide appropriate drums/containers for use. The Contractor shall properly handle and transport all hazardous waste or regulated waste material into the drums/containers provided.

D. All TCLP sampling and analysis shall be subject to approval by the Owner. A submittal shall be provided by the Contractor which details the procedures for the sampling including the name of the sampler, methodology for sample collection, sample preparation and chain-of-custody procedures. The laboratory to be used shall be certified by the State of Massachusetts and the American Industrial Hygiene Association (AIHA).

E. No demolition or recyclable material shall be removed from the site unless approved by the Owner. The Contractor shall provide the name of the transporter and disposal facility for each type of waste (i.e. hazardous, non-hazardous, regulated or recyclable) for review and approval by the Owner.

F. Recyclable/Salvaged Materials (Non-Hazardous): The Contractor shall note that any demolition material deemed to be recyclable or salvageable by the Contractor may contain lead, cadmium or chromium which could result in the recycling or salvage facility rejecting acceptance regardless of the lead, cadmium or chromium content or TCLP result. The Contractor is hereby notified of this fact and shall bear all responsibilities and costs associated with acceptance and/or rejection of such materials in a C&D landfill, waste disposal facility and/or a recycling/salvage facility under their Base Bid.

G. The following materials are considered Hazardous Waste (Lead, Cadmium or Chromium) if they are generated in a form by themselves and shall be disposed of as such:

    a. Paint chip and paint chip debris

H. The Contractor shall be responsible for proper disposal of all materials outlined herein. In addition, all costs associated with worker protection or environmental protection requirements for such work shall be the responsibility of the Contractor.

END OF SECTION

SECTION 02.08.20

ASBESTOS ABATEMENT

PART I - GENERAL

1.1 RELATED DOCUMENTS

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

B. The Owner shall not incur any additional costs due to negligence or regulatory requirements imposed upon this project due to the Asbestos Abatement Contractor failing to abide by the requirements of the specifications and applicable regulations.

1.2 SUMMARY

A. Provide all labor, materials, and equipment necessary to complete work of this Section, including but not limited to the following:

1. All Asbestos Abatement work referenced herein shall be performed by a Massachusetts licensed Asbestos Abatement Contractor in accordance with Massachusetts Department of Labor Standards (MADLS) 454 CMR 28.00 Regulations.
2. In addition, all work shall be performed in accordance with a Health and Safety Plan (HASP) developed by the Abatement Contractor in accordance with Occupational Safety and Health Administration (OSHA) regulations, including HAZWOPER, and any other applicable federal, state, or local regulations pertaining to PCB remediation and disposal.
3. All workers handling PCB-containing materials on-Site will be 40-hour HAZWOPER trained in addition to current Massachusetts Asbestos licenses in accordance with DLS 454 CMR 28.00 Regulations.
4. The Contractor shall also provide the project name, contact person and phone number of three (3) projects which were successfully completed of similar size and scope within the last two (2) years. Each project shall have been completed in good standing and the work performed by the Contractor for each project resulted in no work violations/citations, contract delays, contract extensions/disputes or litigation. Failure to provide this information and/or meet the approval of these qualifications by the Owner may result in rejection of the Contractor.
5. The Owner shall also reserve the right to research and utilized other information received from any other projects completed by the Contractor for any project not provided under 1.2 B (2) above, regardless of the date completed, location or circumstances resulting from the outcome of their work. The Owner shall reserve their right to reject the Contractor based upon this review, for any reason, if found to be in the best interest of the Owner.

B. Items to Be Installed Only: None

C. Items to Be Furnished Only: None

D. Related Sections: None

1.3 ALTERNATIVES

A. Alternates: None

1.4 UNIT PRICES

A. Unit Prices: None.

1.5 DEFINITIONS

A. Site: Refers to the Fanning Building located at 24 Chatham Street, Worcester, Massachusetts as outlined by contract documents and drawings.

B. Owner: Refers to the Worcester Public Schools and their designated, authorized personnel.

C. Architect: Refers Nault Architects Inc., 71 Hope Avenue, Worcester, Massachusetts and their designated, authorized personnel.

D. Consultant: Refers to ATLAS Technical Consultant, LLC (ATLAS), 73 William Franks Drive, West Springfield, Massachusetts and their designated, authorized personnel.

E. General Contractor: Refers to the Contractor who has been awarded the overall contract for renovation work outlined by the Contract Documents.

F. Asbestos Abatement Contractor: Refers to the Contractor who is performing asbestos and PCB abatement work as outlined by this Section.

G. Asbestos Project Designer: The MADLS certified Asbestos Project Designer for this project is Mr. Edward Kolodziej (#AD074321), ATLAS Technical Consultant, LLC.

1.6 SUBMITTALS

A. Refer to Division 1 Section Submittal Procedures for administrative and procedural requirements for submitting Shop Drawings, Product data, Samples, and other miscellaneous submittals.

B. In addition to items required by other sections of the Project Manual, the following submittals are required for review and approval by the Owner on/or before the Pre-Construction Meeting:

1. Copies of notifications
2. Chain-of-Command list of all personnel on-site and emergency contact person(s)
3. Work plan which dictates all removal procedures to be implemented

C. In addition to the items required by other sections of the Project Manual, the following submittals are required for final payment

1. Contractor’s Daily Log Notes
2. Personal Monitoring Results
3. Copy of Waste Shipment Records

1.7 DESCRIPTION OF WORK

A. Work: This section details all areas where asbestos & PCB abatement work is to be performed and lists areas requiring special protection during the abatement work. The Contractor shall furnish all labor, materials, services, training, insurance, and equipment as needed to complete

removal of asbestos-containing and asbestos-contaminated materials located as indicated below. The Asbestos Abatement Contractor shall follow all Federal, State and local ordinances, regulations and rules pertaining to asbestos, including its abatement, storage, transportation and disposal.

B. The Contractor shall be responsible for verifying all quantity estimates in preparation of their bids, including the location and conditions of all asbestos-containing materials to be abated under this contract. No additional compensation and/or contract time shall be granted to the Contractor for failure to perform this requirement and no compensation shall be granted for variations in the quantities presented herein.

C. The Contractor shall begin the work within a mutually agreed upon time with Owner, Architect and General Contractor. Contractor shall work in harmony with all other trades performing separate contract work in the building.

D. The following Scope of Work and Requirements shall be applicable for asbestos abatement work at the Fanning Building located at 24 Chatham Street, Worcester, MA. If a specific note for an abatement procedure or requirement is not mentioned herein, the Contractor shall perform the removal of such material in accordance with local, state and federal regulations. The Contractor shall also coordinate all work with the General Contractor, as applicable.

1. All Asbestos Abatement work shall take place in accordance with the provisions outlined herein as well as current local, state and federal regulations. No additional compensation shall be granted to the Contractor for compliance with applicable laws when performing the abatement work at the site. This shall include any regulatory requirements that mandate additional or more restrictive containment and abatement procedures than what has been presented herein. It shall be the Contractor's responsibility to comply with such regulations as well as any other additional requirements outlined by this Section.
2. The Contractor shall be responsible for all demolition work required to access all asbestos materials for abatement. All demolition debris shall be disposed of as asbestos (unless otherwise directed by the Consultant).
3. The Asbestos Abatement Contractor shall coordinate with the General Contractor as to the locations of areas to be abated in accordance with the Scope of Work outlined herein.
4. Coordination shall exist between the abatement under this Section and the disconnection of existing equipment within the building by the Owner.
5. With regards to the variance from requirements on polyethylene sheeting on “impervious wall” surfaces, the Asbestos Abatement Contractor shall be required to adhere to all requirements outlined by MADLS regulations governing work area set-up for asbestos abatement. The Asbestos Abatement Contractor shall take full responsibility including all costs associated with approval and/or denial of such actions (i.e. non-use of polyethylene) if determined to be non-compliant by the Consultant and/or a state or federal agency. If the variance is denied or discontinued by said parties; the Asbestos Abatement Contractor shall proceed with installation of polyethylene sheeting on such surfaces at no additional cost to the Owner.
6. The following requirements shall be applicable for asbestos abatement activities at the site, unless otherwise stated in this section :
    a. Perform abatement of asbestos-containing materials using negative air filtration techniques (estimated at 1-NAFUs for each containment), decontamination chambers, critical barriers, full 2 layer plastic containment’s (2-layers of 4-mil poly on walls, and 2-

layer of 4-mil poly for ceilings) and the encapsulation of post removal surfaces unless otherwise specified in this Section. Other similar building materials may be in/proximity to the work area but are not part of this abatement project and are outside of this scope.

b. Establish a decontamination unit in accordance with applicable regulations. Properly sealed (double waste-bagged, cleaned, labeled, etc.) waste materials may be transported through the decontamination unit to the transport vehicle.

c. Workers shall wear disposable protective suits and respiratory protection for abatement or disturbance of asbestos-containing materials.

d. Consistently and thoroughly wet asbestos containing materials with a fine spray of amended water. Carefully remove (manual hand-methods) and immediately place asbestos in approved and properly labeled 6-mil polyethylene disposal bags or drums. Surfaces shall be free of visible debris and surfaces shall be wiped clean and/or HEPA vacuumed clean.

e. All areas must meet visual inspection criteria and final air clearance criteria as described in Section 3.3 and as required by applicable regulations prior to tear down of polyethylene and area clean up.

7. The following requirements shall be applicable for abatement of all interior/exterior door caulking at the site:

   a. Removal shall include all interior/exterior caulking located on the doors.

   b. This shall also include all underlying caulking and overruns present on the components, underneath the components or on adjacent substrates.

   c. Removal shall also include all through-wall flashing/paper and contaminated brick/block located underneath door thresholds.

   d. All removed sealants, components and associated materials shall be disposed of as ACWM.

8. Any damage as a result of the abatement work shall be repaired by the Contractor or compensate Worcester Public Schools.

9. Comply with requirements for final clearance and release of a work area as described in this Section and as required by applicable regulations prior to tear down of polyethylene and area clean up. Perform Final Clearance Visual Inspections in accordance with requirements outlined in Section 3.3.

10. PCB-Containing Materials
    a. The Asbestos Abatement Contractor shall be made aware that the caulking and glazing compound located on the windows in addition to containing asbestos, also contain Polychlorinated Biphenyl (PCBs) in excess of EPA TSCA 40 CFR 761 Regulations (>50 ppm):
    b. The Asbestos Abatement Contractor shall be required to remove these materials and dispose of them as asbestos and >50 ppm PCB waste. This shall include the caulking and glazing compound as well as the entire component (window unit, framework, etc.) down to the rough opening. All removed components shall be disposed of as asbestos and >50 ppm PCBs. Decontamination of components for reuse, recycling, scrap or disposal as regular construction debris is not permitted.
    c. The Asbestos Abatement Contractor shall be required to provide a Work Plan that details the means and methods for removal of the asbestos and PCB materials identified herein in accordance with this Section and local, state and federal regulations. The Work Plan shall include at a minimum:
    d. Name(s), address(es), and contact(s) of subcontractors retained for the work outlined in

this Section.

e. Detailed description of work activities and progress schedule.
f. Description of engineering controls and procedures used to minimize exposure to PCBs and to mitigate migration of dusts, wash water and contaminants generated by work outlined in this Section.
g. Proposed methods of waste storage, disposal, and transportation.
h. Name(s), address(es), and contact(s) of waste transporter(s) that transport hazardous and non-hazardous waste from the Site to a licensed disposal facility, including EPA identification number and proof of permit, license, or authorization to transport all such waste in all affected states.
i. Name(s), address(es), and contact(s) of proposed disposal facility(ies), and a letter of acceptance indicating that the facility will accept removed materials associated with the work outlined in this Section.
j. Health and Safety Plan (HASP): Developed in accordance with Occupational Safety and Health Administration (OSHA) regulations, including HAZWOPER, and any other applicable federal, state, or local regulations.
k. Waste Profiles: All waste profiles, applications and questionnaires shall be provided to the Architect prior to the start of the work. The Waste Profiles must be approved and signed off by the Owner prior to generating any PCB related waste materials on-site. Once approved, the Asbestos Abatement Contractor shall provide a copy of the Waste Manifest and/or Waste Shipment Record to be used for shipment of the waste from the site to the disposal facility.

11. Refer to Attachment A (Table 1.0) for a summary of materials that require abatement at the site. In addition, refer to the Drawings for locations and quantities identified by Table 1.0.

1.8 CODES AND STANDARDS

A. All work shall conform to the standards set by applicable Federal, State and local laws, regulations, ordinances, and guidelines in such form in which they exist at the time of the work on the contract, and as may be required by subsequent regulations. In addition to any detailed requirements of the Specification, the Contractor shall at his own cost and expense comply with all laws, ordinances, rules and regulations of Federal, State, Regional and Local Authorities regarding handling and storing of asbestos waste material. This includes all applicable OSHA regulations.

B. All regulations and other governing agencies in their most current version are applicable throughout this project. Where there is a conflict between this Specification and the cited State, Federal, or local regulations, the more restrictive or stringent requirements shall prevail. This Section refers to many requirements found in these references, but in no way is it intended to cite or reiterate all provisions therein or elsewhere. It is the Contractor's responsibility to know, understand, and abide by all such regulations and common practices.

1.9 FEES, PERMITS & LICENSES

A. The Contractor shall pay all licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or process in the performance of the work specified in this section. The Contractor shall be solely responsible for costs, damages, or losses resulting from any infringement of these patent rights or copyrights. The Contractor shall hold the Owner and Consultant harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights. If the Contract Specification requests the use of any product, design, invention, or process that requires a licensing, patent or royalty fee for use in the performance of the job, the Contractor shall be responsible for the fee or royalty fee and shall

disclose the existence of such rights.

B. The Contractor shall be responsible for costs for all licensing requirements, where applicable and notification requirements and all other fees related to the Contractor's ability to perform the work in this Section.

C. Secure all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

1.10 CLEANING

A. Maintain the work site in a neat and orderly manner at all times, so as not to interrupt or infringe upon the work of other trades. Perform all final cleaning of abatement work areas as required by this Section and Massachusetts Regulations to the approval of the Owner's Consultant. Upon completion of work in any given area, Asbestos Abatement Contractor shall remove all material and equipment associated with the work, not necessary to complete other phases of the work in that area.

B. At the end of each work day the Contractor shall ensure that the building is secured and all exterior areas of the building are free and clear of all work-related debris.

C. Comply with all requirements for final clearance and release of a work area as described in this Section and required by the Massachusetts Regulations prior to take down of polyethylene and area clean-up.

1.11 COORDINATION

A. Extend full cooperation to Owner in all matters involving the use of Owner's facilities. At no time shall the Contractor cause or allow to be caused conditions, which may cause risk or hazard to the general public, or conditions that might impair safe use of the facility.

B. Complete Asbestos activities in the phases of the final schedule agreed upon by Owner.

C. The Contractor shall be made aware that separate contracts will be engaged by the Owner for other work to be performed within the site building. The Contractor shall be made aware that those Contracts will be on-going during the same time as the asbestos abatement work outlined herein. The work of this Contract shall proceed in "harmony" with the work of those projects, which will be subject to coordination by the Owner. No additional compensation or contract time shall be granted for failure to recognize and comply with this requirement.

1.12 SUBSTITUTION OF MATERIALS OR METHODS

A. Owner and Consultant approval is required for all modifications to methods, procedures, and design, which may be proposed by the Contractor. It is the intent of these documents to allow the Asbestos Abatement Contractor to present alternative methods to the abatement processes herein, for review by Owner and Consultant. Any such modifications or substitutions to methods, procedures, or design shall comply with applicable regulations. The Contractor shall submit the proposed modification or substitution in accordance with the requirements of the General Conditions, and no later than fifteen (15) working days prior to planned commencement of proposed modification, for review and approval.

B. Unless requests for modification or substitution are made in accordance with the above instructions and the instruction of the General Conditions, supported by sufficient proof of equality, the Contractor shall be required to furnish the specifically named or designed items, methods or procedures designated in this Section.

C. If the modification or substitution necessitates changes or additional work, same shall be provided and the Contractor shall assume the cost and the entire responsibility thereto unless performed under the approved Change Order Process.

D. The Owner and Consultant's permission to make such substitution shall not relieve the Contractor from full responsibility for the work.

1.13 SITE SECURITY

A. The Contractor is responsible for performing all work under this contract without contaminating the building or environment with asbestos fibers. This includes interior areas, outside containment locations, machinery and equipment and any other release into unregulated spaces. The Contractor is responsible for making right and clean-up of any such contamination if found to be present.

B. The Contractor will be responsible for the security of the abatement area, allowing only authorized personnel into the area, and securing assigned entrances and exits at the end of the work day. Signs will be posted prior to asbestos removal as required in 29 CFR 1926.1101.

1.14 PROJECT MONITOR

A. The Owner has retained ATLAS, as their Consultant for technical advisement and project management during the Project. In addition, ATLAS will perform project monitoring services during abatement activities. The Asbestos Abatement Contractor shall regard ATLAS's direction, as authoritative and binding as provided herein, in matters outlined by this Section.

B. ATLAS's licensed Project Monitor, acting as the Owner's Representative, will perform monitoring of the Contractor's work practices and performance, inspection of the worksites, and air sampling and analysis for each phase of the asbestos removal project. Quality control and testing criteria have been established in these specifications, and will be strictly enforced. ATLAS's Project Monitor will review matters relating to safety, interpretation of the specifications, and scheduling of work, and will make decisions upon consultation with the Owner.

1.15 TEMPORARY FACILITIES

A. The Contractor shall coordinate the Owner as to the use of the existing power and water within the building.

B. All temporary hook-ups to the existing power and water within the building shall be the responsibility of the Contractor.

C. The Contractor shall also be responsible for providing all temporary toilets required for workers to use during the construction project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials and equipment proposed to be used on this project shall be subject to the acceptance of the Owner and Consultant. The Contractor shall comply with local, state and federal regulations pertaining to the selection and use of materials and equipment on this project. The Contractor shall provide a submittal on all materials and equipment to be used for review and approval by the Consultant prior to commencement of the work.

PART 3 - EXECUTION

3.1 WORK PROCEDURES

A. All asbestos abatement work shall take place in accordance with the provisions outlined herein as well as local, state and federal regulations. In particular, Massachusetts DLS and DEP regulations regarding asbestos removal and disposal shall be adhered to.

B. Visual Inspections: Work areas shall pass a visual inspection conducted by the Site Supervisor responsible for the project and the Owner's Project Monitor (i.e. Consultant). The criterion for this inspection will be the absence of visible debris in accordance with ASTM standard E1368-90. A certificate of visual inspection will be signed by the Project Monitor and the Site Supervisor after final inspection clearance. The Contractor will be responsible for the costs of visual inspection and testing required for any work which fails the visual inspection.

3.2 DISPOSAL

A. All costs associated with removal and proper disposal of the asbestos and PCB materials associated with the work of this Section shall be the responsibility of the Asbestos Abatement Contractor under the Contract.

B. All testing required by the waste transporter and/or disposal facility to profile the materials for acceptance shall be the responsibility of the Asbestos Abatement Contractor. All costs associated with sample collection, analysis and interpretation of the results shall be borne by the Asbestos Abatement Contractor under the Contract. All analytical results shall be provided to the Consultant for review and approval.

C. NO WASTE SHALL LEAVE THE SITE UNLESS AUTHORIZED BY THE OWNER.

D. There are two (2) types of waste streams to be generated on this project. Refer to Part 1.04(C) of this Section for additional information.

1. Asbestos and >50 PCB Bulk Product Waste – Includes caulking, backer rod, window units and associated components.
2. Asbestos and >50 PPM PCB Remediation Hazardous Waste – Includes materials used in abatement of asbestos and PCBs (i.e. PPE, polyethylene sheeting, rags, waste water, vacuum dust, HEPA filters, disposable tools, etc.).

E. The following outlines the requirements for transportation and disposal of each waste stream on this project:

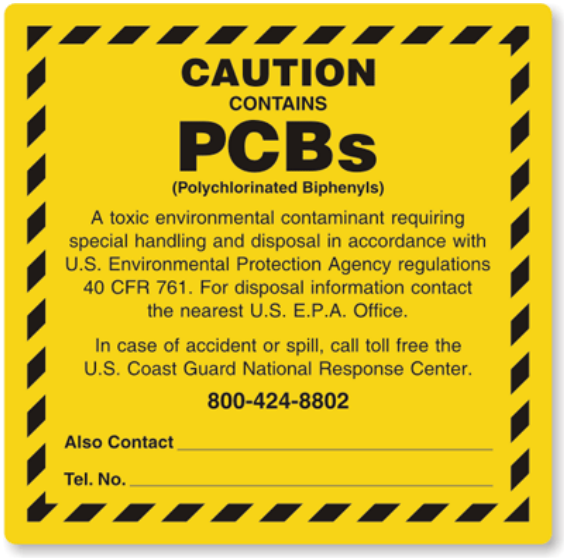
1. General requirements:
   i. All waste material shall be properly packaged and labeled for asbestos disposal in accordance with MADEP 310 CMR 7.15, MADLS 454 CMR 28.00 and NESHAP Regulations.
   ii. All waste packaged material shall be affixed with PCB labels in accordance with 40 CFR 761 and hazardous waste labels in accordance with MADEP 310 CMR 30.000, unless an

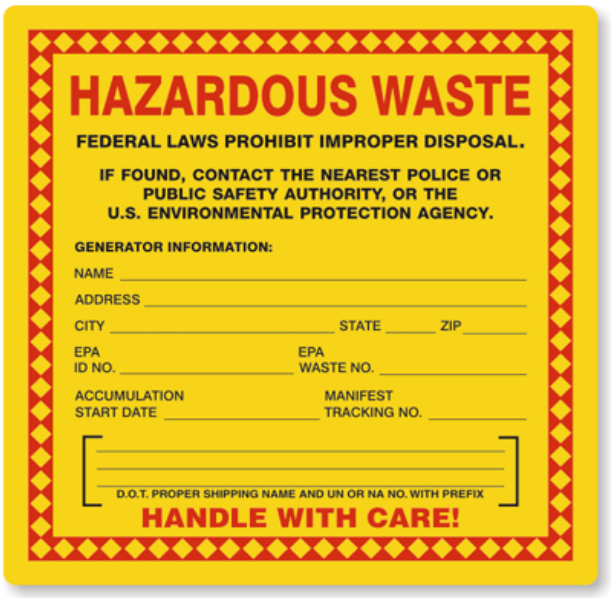
exemption is obtained from MADEP.

iii. All asbestos and PCB waste items shall be disposed of in accordance with state and federal regulations at a licensed waste facility.

iv. Note: The proposed waste disposal sites and Waste Profiles to be used on this project shall be provided to the Owner for review and approval. The Owner reserves the right to approve or reject any proposed facility if it is found to be in the best interest of the Owner. If a site is rejected by the Owner, the Asbestos Abatement Contractor shall not be compensated for any costs for changing waste disposal sites.

v. All waste containers shall be placed in a designated storage area in accordance with 762.65 on site that is secured and within a chained link fence that is locked. Any drums, Gaylord boxes, etc. shall be placed inside an enclosed trailer or other storage container that is locked and within the chained link fence area. The waste containers, drums or boxes will be placarded as containing asbestos and PCB Waste with markings meeting the EPA requirements of 40 CFR 761.40 and 761.45. This shall include asbestos and PCB labels and the yellow hazardous waste label on all 4 sides of the containers, drum or box.





Note: PCB Bulk Product Waste and PCB Remediation Waste materials generated on the project shall be properly packaged, clearly marked and segregated from each other in separate enclosed containers. As part of the Contract, PCB waste that is containerized shall be shipped from the site within 30 days from the start date of filling that specific dumpster, drum or trailer. If the 30 day time period is exceeded, the Owner may take possession of the waste and ship it off-site for disposal. However, the Asbestos Abatement Contractor shall still be responsible for all costs associated with removal of the waste from the site for final disposal at a licensed waste landfill. All such costs associated with removal and disposal of the waste shall then be deducted from the General Contractor's Contract.

vi. Additionally, all waste containers shall be closed-top to prevent any water from infiltrating the container and be lined with two (2) layers of 6 mil polyethylene sheeting.

vii. Manifests: A Waste Manifest is required for the removal from the premises, and disposal of all items included in this Section. The Asbestos Abatement Contractor shall be required to complete a WASTE PROFILE for each type of material to be disposed of and provide a copy to the Owner for review and approval prior to the start of the project. NO WASTE SHALL LEAVE THE SITE UNLESS THE WASTE PROFILE HAS BEEN APPROVED BY THE OWNER.

- Each manifest shall note the truck registration number, state of registration, name of driver, type of waste, quantity of waste and date of removal of material from the site.
- Unless the Contractor obtains a site-specific exemption from the MADEP, the Asbestos Abatement Contractor shall comply with the RCRA Hazardous Waste Manifest policies (as required by MADEP hazardous waste regulations 310 CMR 30.000) and is responsible for utilizing the Owner's provided EPA Identification Number for the site.
- The Owner will be designated as generator and will sign all manifests and waste profile applications or questionnaires.

Note: A copy of the completed draft Waste Manifests to be used (excluding the quantity of waste and signatures) shall be provided to the Owner for review and approval 48 hours prior to the waste being picked up at the site. If acceptable, the Asbestos Abatement Contractor shall then notify the Owner at least 48 hour in advance for shipment of waste from the site so they can make arrangements to

sign the Waste Manifest.

F. Additional Requirements – Asbestos Disposal

1. Packaging: Prior to post-abatement inspection, asbestos- containing waste shall be packaged in sealed double containers and removed from the work area to a specified transportation vehicle or a designated holding area approved by the Owner. At the end of each work day the Asbestos Abatement Contractor shall remove the debris accumulated during that day's work activities using procedures outlined in the Specifications. The Asbestos Abatement Contractor shall provide a daily tally of all bags removed.

2. Temporary Storage of Waste: An area for temporary storage of asbestos waste must be approved by the Owner. Asbestos waste may only be stored in a restricted area and must be in an enclosed container which is posted and secured whenever not in use. Asbestos waste material shall be loaded into a waste transportation vehicle/dumpster and hauled away as soon as there is a sufficient quantity available for direct transportation to the approved disposal site.

3. OSHA/EPA labeling: Asbestos warning labels having permanent adhesive and waterproof print, or being permanently printed on the container, shall be affixed to the outside of all asbestos containers, and each inside bag, except that nonfriable asbestos-containing waste that has not been and does not have a high probability of becoming, crumbled, pulverized, or reduced to powder need not be labeled. Labels will be conspicuous and legible and shall contain the following warning:

   DANGER
   CONTAINS ASBESTOS FIBERS
   MAY CAUSE CANCER
   CAUSES DAMAGE TO LUNGS
   DO NOT BREATHE DUST
   AVOID CREATING DUST

   The Asbestos Abatement Contractor is directed to properly label each waste bag in accordance with the latest NESHAP standard, Section 61.150, with the following information:

   SITE OWNER'S NAME
   SITE NAME

4. DOT labeling and marking: A DOT "class 9" shipping label and DOT mark shall be applied to or be printed on each packaging of asbestos-containing materials; except for nonfriable asbestos-containing materials that did not become crumbled, pulverized, or reduced to powder; or a limited quantity of asbestos-containing material which is not being transported by air.

5. EPA vehicle marking: Each vehicle transporting asbestos-containing waste shall be marked with asbestos danger signs during loading and unloading of the waste, in accordance with the NESHAP, 40 CFR 61.150.

6. Asbestos waste shipment records: The Asbestos Abatement Contractor shall prepare the waste shipment records. Completed waste shipment record(s) signed by the Asbestos Abatement Contractor, all transporter(s), transferor(s), disposal and/or conversion facility(s), shall be provided to the Owner within 30 days of the time at which the asbestos-containing

wastes are received at the disposal and/or conversion facility(ies), which shall be no longer than 40 days after the waste was accepted by the initial transporter. The Waste Shipment Record shall specify the designating number of bags or cubic yard(s) of asbestos waste.

7. Depositing: Asbestos waste shall be deposited as soon as practical at a regulated waste disposal site, except for EPA "Category I" nonfriable ACM that has not become friable, nor will it be or has been sanded, ground, cut, or abraded. Waste disposal sites for asbestos materials will be in accordance with 40 CFR 61.25, Waste Disposal Sites. The Contractor shall provide written evidence that the site is approved for asbestos disposal by the EPA, State and local regulatory agencies.

3.3 QUALITY CONTROL AND TESTING

A. The Asbestos Abatement Contractor shall be responsible for achieving acceptable visual and final air clearance testing for ALL abatement areas as follows:

1. Clearance inspection: ATLAS's Project Monitor shall inspect the work area and surrounding areas for clearance using visual and physical methods, prior to clearing the project for air monitoring clearance procedures.

2. For each asbestos abatement area, post abatement clearance air samples will be taken when a visual inspection by the Consultant's Project Monitor detects no visible debris, and surfaces are encapsulated and dry. Based upon the quantity of material to be abated, either Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM) clearance testing will be performed to confirm the completion of removal. All clearance testing shall be performed in accordance with state of Massachusetts and EPA "Asbestos Hazard Emergency Response Act" (AHERA) Regulations. The work areas shall be considered complete if the following criteria are met:

   a. Containments cleared and samples analyzed by Phase Contrast Microscopy (PCM): Maximum airborne fiber concentration per sample is <0.010 fibers per cubic centimeter (minimum 5 samples).

   b. Containments cleared and samples analyzed by Transmission Electron Microscopy (TEM): The average concentration of asbestos on the five inside containment samples are below 70 structures per square millimeter (70 s/mm^2).

   c. TEM air clearance analysis shall be at 24-hour turnaround time upon laboratory receipt of the samples.

B. Should results indicate a fiber concentration greater than the clearance criteria stated above or if the visual inspection fails, the Asbestos Abatement Contractor shall reclean the entire work at no additional cost to Owner, utilizing the methods specified in this section. The Asbestos Abatement Contractor shall pay for all additional testing and inspections until the clearance level is achieved as per this Section. The cost of additional testing and inspection shall be paid by the Asbestos Abatement Contractor by subtracting the cost for analysis and inspector's time from the Contract total. This shall also include resampling of any areas where air cassettes became overloaded due to construction activities.

ATTACHMENT A

TABLE 1.0

SUMMARY OF ACM TO BE ABATED

TABLE I WORCESTER PUBLIC SCHOOLS FANNING BUILDING		
MATERIAL	**RESULTS**	**NOTES**
Door Caulking	3-20% Chrysotile	Refer to Drawings for location and quantities.
Ceramic Floor Tile Grout & Thin-Set	2% Chrysotile	Refer to Drawings for location and quantities. Removal of a minimum of 3 SF away from doorway.

SECTION 02.41.00

SELECTIVE DEMOLITION

I. PART 1 - GENERAL

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1.01 GENERAL

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 WORK INCLUDES

A. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following major items:

1. Confirm that abatement is complete and all required clearances have been given.
2. Removal of select existing doors, frames and hardware.
3. Removal of select existing concrete paths and granite stairs.
4. Removal of select existing concrete landing, metal railing, stair and fencing

B. The following elements will be **performed by the Owner**, under separate contracts, for which the Prime Contractor has a coordinating responsibility:

1. WPS will removal any loose items from the project areas so the GC can complete specified scope.

1.03 RELATED WORK

A. Section 02.08.00 - ABATEMENT: *for removal of Asbestos containing material.*
B. Section 02.08.10 - DISTURBANCE OF LEAD, CADMIUM & CHROMIUM MATERIAL: *coordination.*

C. Electrical “make-safe” work is included on the electrical drawings.

1.04 **Alternates: N/A**

1.05 SUBMITTALS

A. Refer to SECTION 01.33.00 - SUBMITTALS *for submittal provisions and procedures.*

B. Schedule: Provide detailed sequence of demolition and removal work.

1.06 JOB CONDITIONS

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

B. Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel.

2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations. Protect site with suitable coverings when necessary.

3. Remove protections at completion of work.

C. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

D. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

E. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

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

G. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Owner. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

H. Environmental Controls: Use temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection. Provide negative air equipment throughout demolition as a means of dust and odor control.

II. PART II - PRODUCTS (Not Applicable)

III. PART III - EXECUTION

3.01 ASBESTOS ADVISORY

A. The Owner has tested the project area elements scheduled to be demolished, for the presence of asbestos containing materials (ACMs), see section 02.08.00 and Appendix A for a complete summary.

B. If hazardous materials beyond those identified for removal are encountered during demolition operations, stop work immediately and notify the Owner and Architect. If work cannot be stopped safely, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

3.02 INSPECTION

A. Prior to commencement of demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Architect prior to starting work.

B. Contractors are advised that although school is not in session at the beginning of the project, the building will remain partially occupied over break the School will be in full operation for the duration of the project.

3.03 PREPARATION

A. Submit a demolition plan and schedule under the provisions of Section 01.33.00 - Submittals, prior to performing any demolition work. Adjust schedule as required to accommodate ongoing research in occupied areas. In some cases, work after hours may be required.

B. File all appropriate paperwork and obtain all required permits prior to the start of demolition, including but not limited to:
   1. AQ-06 demolition permit.
   2. Dumpster permit, if debris is not going to be removed by truck a the end of each day.

C. Sequence work in occupied areas so as to minimize disruption, and to allow continued use of spaces.

D. Cease operations and notify the Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

E. Areas to be renovated will be emptied of loose contents prior to the start of demolition, by the Owner. Where demolition of utilities and other items is required on other floors, the general contractors shall cover and protect furniture, equipment and fixtures from soiling or damage when demolition work is performed, remove said protection after the work is complete, and clean room to original condition prior to returning to occupants.

F. Erect and maintain dust-proof partitions and closures, and other means as required to prevent spread of dust or fumes to occupied portions of the building, as specified in Section 01.50.00. Temporary partitions at corridors shall not restrict access of egress through the corridor, and shall not reduce the clear width to less than what is required by Code.

G. Coordinate temporary building HVAC shutdowns in the event dust-generating demolitions is to be performed adjacent to building air intake points. The general contractor shall provide temporary ventilation through fans, to control the spread of dust through the building and maintain a negative pressure in the project area, relative to the remainder of the building.

H. Extra care and precaution shall be taken by the GC to protect any live utilities from damage until such time as they can be demolished by the appropriate sub-trade. The GC will be responsible for the correction or replacement any and all damages to materials scheduled to remain.

3.04 GENERAL DEMOLITION

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

B. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

C. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Designer in written, accurate detail. Pending receipt of directive from Designer, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

D. Notify Architect immediately if materials scheduled to remain are found to be unsuitable for the installation of the new work, or if existing conditions deviate substantially from those shown on the drawings. Remove and replace, or make good, any existing materials unsuitable for installation of new work.

E. Sequence work in accordance with requirements of Section 01.31.00. Schedule new work to coincide with demolition work, to minimize amount of disruption.

3.05 ENTRY DOORS, FRAMES AND HARDWARE

A. Confirm that the abatement, electrical make-safe have been completed.

B. Remove select existing metal door frames, metal doors and associated hardware to the rough masonry opening as required to install the new door systems.

C. Remove any damaged masonry / bricks at the rough opening.

3.06 REMOVE SELECT CONCRETE PATHS, REAR LANDING, STAIRS, RAILINGS AND GRANITE STEPS

A. Remove select portion of the existing chain link fence as shown on the drawings, re-secure the portions to remain in place.

B. Remove the existing metal railings at the rear entry as shown on the drawings.

C. Remove the existing rear concrete stairs, rear landing and deteriorated concrete paths, excavate the areas in preparation for the new work.

D. Remove select existing granite stairs at the front / main entry and salvage for reinstallation.

E. Excavate and re-grade the project areas in preparation for the new work, stockpile any removed materail in preparation for final re-grading / re-seeding.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. All demolished materials may be conveyed to dumpsters at grade by carts through the building. Carts shall be covered at all times while being transported, and contractors shall sweep and damp mop dust and debris from transportation route at the end of each work day.

1. Follow the shortest route to the exterior. Transporting debris through finished portions of the building, particularly portions not receiving work, is discouraged and shall be minimized.

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

C. Burning of removed materials is not permitted on project site.

3.08 DISPOSAL, CLEAN-UP AND REPAIR

A. Upon completion of demolition work, remove tools, equipment and demolished materials from site.

1. The general contractor shall provide dumpsters for all project debris. One 30-yard dumpster will be permitted, where directed by WPS. The dumpster shall not obstruct access, and shall be emptied in a timely manner.

B. Remove protections and leave interior areas broom clean. Where demolition was performed in occupied areas, all surfaces shall be vacuumed and wiped down free of dust.

C. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

D. Any damages to existing furnishings and/or equipment, shall be reimbursed by the general contractor, who shall recoup costs from other contractors as appropriate.

END OF SECTION
02.41.00

SECTION 03.30.00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The 00.72.00 **Conditions of the Contract** and all sections of **Division 01**, General Requirements, shall be part of this section unless otherwise specifically excluded.

B. This Contractor must be familiar with all other Divisions and Sections which affect this Work.

1.2 DESCRIPTION OF WORK

A. **Work included:** Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes for the new footings, ramp foundation walls, ramp surfaces, stair and concrete paths.
2. Survey to confirm ramp is compliant with all ADA and MAAB requirements.

B. **Alternates: N/A**

C. **Items to Be Installed Only:** Install the following items as furnished by the designated Sections

1. None. All items to be installed by this trade, shall be furnished by this trade.

D. **Items to Be Furnished Only:** Furnish the following items for installation by the designated Sections:

1. None

E. **Related Work Specified Elsewhere:** The following items are not included in this Section, and will be performed under the designated Section:

1. Section 02.41.00 – SELECTIVE DEMOLISION for removal of existing concrete items.
2. Section 05.71.20 – METAL RAILINGS for coordination of railing system attachment.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

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

B. Prepare shop drawings to confirm that the proposed layout meets all MAAB and ADA requirements.

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

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

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

E. Submit test data for aggregates proposed for use, indicating source and compliance with specification requirements.

1.5 QUALITY ASSURANCE

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

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

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

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

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

E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

F. Field Testing: The General Contractor shall coordinate and pay for a third-parting testing agency to test the concrete delivered on site. The industry standards for testing shall be followed, for both frequency and method and depend on the amount of the pour and what type of pour it is (footings, walls, slabs, etc.). All field reports and testing shall be sent from the third-party testing agency directly to all parties the construction team.

G. As included in Section 01.77.00 – Closeout, the General Contractor is required to coordinate and pay for a third party to survey the new ramps and pathways to confirm that all ADA and MAAB requirements are met. If any area areas found to be out of compliance, they will need to the repaired or replaced and re-survey unit that are confirmed correct. The final stamped survey shall be included in the project closeout deliverable and need to be stamped and certified by an engineer registered in MA.

H. ACI Publications: Comply with the following, unless more stringent provisions are indicated:
1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
2. ACI 301, "Specification for Structural Concrete."
3. ACI 302.1R, Guide to Concrete Floor and Slab Construction.
4. ACI 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
5. ACI 305.1, Specification for Hot Weather Concreting.
6. ACI 306R, Guide to Cold Weather Concreting.
7. ACI 318, Building Code Requirements for Structural Concrete.
8. ACI 347R, Guide to Formwork for Concrete.

9. ACI 439.5R, Comprehensive Guide for the Specification, Manufacture and Construction Use of Welded Wire Reinforcement.
10. “Placing Reinforcing Bars", CRSI & WCRSI Recommended Practices.
11. ACI 306R, Guide to Cold Weather Concreting.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.
   1. Avoid damaging coatings on steel reinforcement.
   2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963M.

2 - 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.

   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

      a. High-density overlay, Class 1, or better.

B. 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.

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

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

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

   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

2.2 STEEL REINFORCEMENT

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

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

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

B. Joint Dowel Bars: Plain-steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type II.

B. Blended Hydraulic Cement: ASTM C 595M, Type IP, portland-pozzolan cement.

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

1. Class: Moderate weathering region, but not less than 3M.
2. Nominal Maximum Aggregate Size: 3/4 inch.
3. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 sieve, and less than 8 percent may be retained on sieves finer than No. 50.

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

2.5 ADMIXTURES

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

B. Air-Entraining Admixture: ASTM C 260.

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

2.6 CURING MATERIALS

A. Water: Potable.

2.7 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

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

2.8 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

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

C. Footings and Foundation Walls: Proportion normal-weight concrete mix as follows:
   1. Compressive Strength (28 Days): 4000 psi.
   2. Maximum Slump: 4 inches.

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

   1. Compressive Strength (28 Days): 4000 psi.
   2. Maximum Slump: 4 inches.

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

F. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete exposed to deicers or subject to freezing and thawing while moist.

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

   1. Air Content: 6 percent for 3/4-inch- nominal maximum aggregate size.

H. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

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

J. Aggregates:

   1. Normal weight aggregates: conform to ASTM C33, (4.2.1.2).
   2. Coarse aggregate: Fill on stair pans: Gradation #8. / All other classes: Gradation #57.
   3. For architecturally exposed concrete, use a single source of uniform quality throughout the work.

K. Waterstops: Provide waterstops at all construction joints and other joints in all foundation walls below grade and where shown on the drawings. Size to suit joints. Provide either premolded polyvinylchloride or swellable type.

   1. Premolded: flexible, polyvinylchloride, with center bulb. CRD C572.
   2. Rubber and Swellable Clay CRD C513.

L. Structural Bonding Compound: Epoxy adhesive, 100% solids, two-component material suitable for use on dry or damp surface. Subject to project requirements, provide one from the following manufacturers:

   1. Euclid Chemical Company.
   2. Kaufman Company.
   3. Sika Corporation.

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

   1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use air-entraining admixture on exterior slabs and concrete exposed to weather.

2.9 FABRICATING REINFORCEMENT

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

2.10 CONCRETE MIXING

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

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

3PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Verify that excavations are free of water and ice, are of the required dimensions, and have been approved by the Soils Engineer, prior to placing concrete.

B. Determine field conditions by actual measurement.

C. Notify Architect not less than 24 hours in advance of placing concrete. Place concrete only when Construction Manager is present, unless this requirement is specifically waived.

3.2 FORMWORK

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

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

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

1. Class A, 1/8 inch.
2. Class B, 1/4 inch.
3. Class C, 1/2 inch.
4. Class D, 1 inch.

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

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

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

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

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

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

I. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

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

3.3 EMBEDDED ITEMS

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

1. Install anchor bolts, accurately located, to elevations required.
2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.4 REMOVING AND REUSING FORMS

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

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

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

3.5 SHORES AND RESHORES

A. Comply with ACI 318, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.6 STEEL REINFORCEMENT

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

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

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

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

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

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

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

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

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

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of 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.
2. Division 7 Section "Joint Sealants," are indicated.

3.8 CONCRETE PLACEMENT

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

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

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

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

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

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

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

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

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

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

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

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

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 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. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

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. Remove fins and other projections exceeding 1/8 inch in height.

1. Apply to concrete surfaces to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:

1. Apply to concrete surfaces exposed to public view.
2. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. 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.

3.10 FINISHING HORIZONTAL SURFACES

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

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.

1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, Portland cement terrazzo, and other bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. 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.

D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

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

3.11 MISCELLANEOUS CONCRETE ITEMS

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

3.12 CONCRETE PROTECTION AND CURING

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

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

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

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

    a. Water.

3.13 JOINT FILLING

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

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

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

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

3.14 CONCRETE SURFACE REPAIRS

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

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

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

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with

bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

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

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

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

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

END OF SECTION
03.30.00

SECTION 04.05.00

MASONRY REPAIRS

I. PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The 00.72.00 **Conditions of the Contract** and all sections of **Division 01**, General Requirements shall be part of this section unless otherwise specifically excluded.

B. This Contractor must be familiar with all other Divisions and Sections which affect this Work.

1.02 SECTION INCLUDES

A. Provide and install masonry repairs including all preparation and protection including weather protection, as follows:
   1. Repair / Replace / Re-Point damaged masonry walls where required.
   2. New counter / through-wall flashings.

B. **Alternates:** N/A

1.03 RELATED SECTIONS

A. Section 02.42.00 - SELECTIVE DEMOLITION *for coordination with demolition scope.*
B. Section 03.30.00 - CAST-IN-PLACE CONCRETE *for coordinating flashing at existing wall.*

1.04 REFERENCES

A. ANSI A41.2 - Building Code Requirements for Reinforced Masonry.

B. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.05 SUBMITTALS

A. Refer to section 01300 - SUBMITTALS for submittal provisions and procedures.

B. Submit manufacturer's product data for all products to be used and all repair methods which vary from those specified, to the Owner's representative, for approval.

C. Submit repair materials to Owner's Representative for approval. No work to begin until all methods and products are approved.

D. Submit proposed schedules to coordinate with owner’s continuing occupation of portions of existing building.

1.06 QUALITY ASSURANCE

A. Masonry Repair Contractor: Company with minimum (five) 5 years experience in masonry restoration, with a minimum of 5 completed projects of similar size and scope.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01500.

B. Store and protect products under provisions of Section 01500.

C. Furnish materials in manufacturer's packaging, including instructions for use.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not lay masonry, re-point, wash down or wet surfaces when temperature may drop below 40 degrees F (4 degrees C) within twenty four hours.

B. Follow cold weather procedures in accordance with ANSI A41.2 when temperatures may drop below 40 degrees F (4 degrees C).
   1. Submit cold weather procedures to Owner's Representative for approval.

1.09 EXISTING UTILITIES

A. The Contractor is responsible for coordinating the locations of all existing utilities with the utility provider and “DIGSAFE”.

B. The Contractor shall take every precaution to limit disruption to existing utilities. Any existing utilities disrupted or affected by the Contractor as a result of his/her work shall be repaired at least to the condition that existed prior to construction. The Contractor shall coordinate repair of any utilities with the utility providers and any costs associated with the repair shall be borne by the Contractor.

II. PART 2 PRODUCTS

2.01 MORTAR MATERIALS

A. Provide Type “S” Mortar, conforming to ASTM C270, or as required by mortar analysis to provide equivalent / appropriate strength and composition.

B. Masonry Cement - ASTM, C-91, Type II masonry cement.

C. Sand - Clean, washed, uniformly well graded, ASTM Specification C-144, 100% passing No. 8 sieve, maximum 35% passing No. 50 sieve, fineness modules maintained at 2.25 plus or minus .10. Sand to be light in color, obtained from single source.

D. Water - Clean free of deleterious materials and fresh from public water supply.

E. Measurements of materials shall accurately maintain specified proportions. Workability or consistency or mortar on the board shall be sufficiently wet to be worked under the trowel. Water for tempering shall be available on the scaffold at all times. Mortar which has begun to set or is not used within 2 ½ hours after initial mixing shall not be used. Re-tempering the mortar at the mixer shall not be permitted.

F. If required, the mortar shall have a custom mix to match the color, texture, general construction of the existing mortar.

2.02 BRICK

A. New Brick: to match existing as closely as possible in variation, texture and overall appearance.

B. New brick to be Severe Weather Grade with a water struck face.

C. Existing undamaged brick from may be used provided that new brick and existing brick shall be evenly distributed resulting in a uniform appearance and approved by the owner.

2.03 DETERGENT - Masonry Cleaning agent

A. “Sure Klean 600 Detergent” by Prosoco

B. Approved equals by Diedrich Technologies Inc or Aztec Building Produts will also be accepted.

2.04 MASONRY ACCESSORIES

A. Metal Flashings: to be used as through-wall base H&B “MFL Metal Flashing” or approved equal 16oz. red copper #110 alloy, meeting ASTM B370.
   1. Size to span wall from cavity to face of veneer. Extend flashing 6" minimum above cavity drainage material.
   2. Provide inside and outside corner pieces, where applicable.
   3. Provide end dams where flashings meet vertical steps in foundation walls.
   4. Provide manufacturer’s splice tape where lengths of flashing overlap.
   5. Provide manufacturer’s adhesive flashing or tape at top of metal flashing.

B. Compressible Filler: HB “NS - Closed Cell Neoprene Sponge” or equal premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

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

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

E. Weep/Vent Products: H&B “QV – Quadro Vent” or approved equal 2-1/2” tall rectangular polypropylene weep with honeycomb core to allow drainage which preventing ingress of insects.

F. Cavity Drainage Material: H&B “Mortar Trap” or approved equal free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Provide strips, full-depth of cavity and 10 inches wide, with dovetail shaped notches 7 inches deep that prevent mesh from being clogged with mortar droppings or equivalent.

2.05 REINFORCING

A. Reinforcing shall be truss type, of width required for the total wall thickness, placed at least every two courses, constructed as follows:

   1. hot dip galvanized units fabricated form 9 gauge cold-drawn steel conforming to ANSI/ASTM A82, side rods with 3/16 inch diameter and gage cross ties, with a width of approximately 2 inches less than total thickness of wall.

   2. Joint reinforcing shall be fabricated in straight lengths of not less than 10 feet with matching pre-fabricated corner and intersection units.

   3. Joint reinforcing shall be fabricated from cold-drawn steel wire conforming to ASTM A82 and hot-dip galvanized after fabrication with 1.5 ounces zinc coating per square foot of

wire surface in accordance with ASTM A153, Class B-2.

2.06 MASONRY CLEANERS

A. Cleaner to be selected for suitability with all masonry materials incorporated into building envelope.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Manufacturers: Sure-Kleen “Vana Trol” or approved equal by:

(a) Diedrich Technologies, Inc.
(b) EaCo Chem, Inc.
(c) ProSoCo, Inc.

C. Proprietary Non-Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Product: EaCo Chem, Inc.; SOS 50.

III. PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to be rebuilt with Owner's representative prior to starting work.

B. Start of installation constitutes acceptance of existing conditions.

3.02 PREPARATION

A. Protect areas and surfaces to remain unaltered by the work of this section from damage or disfiguration.

B. Protect adjacent walking and parking areas from damage or unsafe conditions from the work. Close off, areas, materials, and surfaces not receiving work of this Section to protect from damage.

3.03 RE- POINTING

A. Cut out masonry joints to receive new pointing carefully, as not to disturb the areas not receiving work. Remove mortar to minimum depth 2 to 2 ½ times the width of the joint. Continue cut deeper if until suitable material is exposed, any loose or disintegrated mortar shall be removed to beyond the minimum depth stated above.

B. Remove mortar in a clean and uniform manner from each masonry unit, leaving square corners to the back of the cut.

C. Prior to the installation of the new mortar joint, each joint shall be rinsed with a jet of clean potable water to remove all loose particles and dust.

D. At time of filling all joints shall be damp, but with not standing water present. Continually mist wall areas if necessary.

E. Install new mortar in a neat and uniform manner. Tool new joints to match existing adjacent joints.

F. Mock-up:
   1. A mock-up area of approximately 4'x4' shall be completed and reviewed by the owner and the architect prior to the remaining work being completed.
   2. The location of the mock-up area will be determined by the owner and the architect.
   3. Once reviewed and accepted, the mock-up areas will serve as the standard of quality for the remainder of the project.

G. All cutting and repointing work at the chimney shall be coordinated with the Roofing contractor and shall be performed prior to the new roof being installed. Installation of new counter-flashing shall be co-ordinated with the installation of the new roof / roof flashing.

3.04 MASONRY ACCESSORIES

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows, unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
   2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge covered with elastomeric membrane, lapping at least 4 inches.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
   1. Use open head joints to form weep holes.
   2. Space weep holes 24 inches o.c., unless otherwise indicated.

E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Miscellaneous Masonry Accessories" Article.

3.05 CLEANING

A. Clean work under provisions of Section 01.74.13 as appropriate.

B. Remove excess mortar and mortar smears before setting if possible.

C. Clean re-pointed masonry surfaces and surrounding areas with approved detergent.
   1. Protect all surrounding metal areas, painted surfaces, adjacent shrubs / plant life and building occupants.
   2. Pressure washer may not be used with the solution as over-spay and wind-born materials cannot be easily controlled.
   3. Clean areas with detergent and densely packed, soft-fibered masonry washing brush.
   4. Dilute as recommended by the manufacturer.
   5. Rinse with high-pressure 400 psi spay, with clean potable water.

6. Test in small, discrete areas prior to clean all required areas.

D. Use non-metallic tools in cleaning operations.

E. Replace defective mortar. Match adjacent work.

F. Clean other soiled surfaces with cleaning solution.

G. Clean surrounding surfaces.

END OF SECTION
04.05.00

SECTION 05.71.20

METAL RAILINGS

I PART 1 - GENERAL

1.01 GENERAL

A. General and Supplementary General Conditions, Special Conditions and applicable parts of Division I as part of this Section.

B. This Contractor must be familiar with all other Divisions and Sections of the Specifications which affect the work of this Section.

1.02 DESCRIPTION OF WORK

A. **Work included:** Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. New exterior metal railings system for new ramps and stairs.
2. All brackets, clips, hardware, etc. for the system.

B. **Items to Be Installed Only:** Install the following items as furnished by the designated Sections:

1. None.

C. **Items to Be Furnished Only:** Furnish the following items for installation by the designated Sections:

1. None.

D. **Related Work Specified Elsewhere:** The following items are not included in the Section, and will be performed under the designated Section:

1. Section 02.41.00 - SELECTIVE DEMOLITION for removal of existing metal rails
2. Section 03.30.00 - CAST IN PLACE CONCRETE for new ramp, stairs, etc.

1.03 REFERENCES

A. 521CMR - regulations of the Massachusetts Architectural Access Board
B. UFAS - Uniform Federal Accessibility Standards
C. ASTM A36 - Structural Steel.
D. ASTM A283 - Carbon Steel Plates, Shapes, and Bars.
E. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
F. ASTM A325 - High Strength Bolts for Structural Steel Joints.
G. ASTM A153 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
H. AWS A2.0 - Standard Welding Symbols.
I. AWS D1.1 - Structural Welding Code.
J. SSPC - Steel Structures Painting Council.
K. ADA - American with Disability Act Accessibility Guidelines

L. ICC International Building Codes; International Code Counsel (Current)

1.04 SUBMITTALS

A. Submit under provisions of Section 01.33.00, manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.

B. Submit Shop Drawings for metal rails showing all components, dimensions, locations, etc. Shop drawings shall bear Engineer's registration stamp. **Shop drawings shall not be prepared until actual pitches of ramps have been field verified by surveys, as required in Section 03.30.00 - Cast in Place Concrete.**

1.05 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personal in accordance with the following:
   1. AWS D1.6/D1.5M, "Structural Welding Code" - Steel
   2. Railings Structural Requirements:
      a. Handrail Assemblies and Guards shall be able to resist a single concentrated load of 200 pounds applied in any direction at any point along the top.
      b. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds applied to one square foot at any point in the system.
      c. Handrail Assemblies and Guards shall be designed to resist a load of 50 plf applied in any direction at the top, and to transfer this load through the supports to the structure.

1.06 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with the new railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.

B. Store in a location and manner to avoid damage. Store handrails and components in a dry, ventilated area. Do not store around uncured concrete or harsh chemicals.

1.08 PROJECT CONDITIONS

A. Maintain environmental conditions within limits recommended by manufacturer for optimum results.

B. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

1.09 WARRANTY

A. The Fabricator shall warrant products and accessories against defects in material and workmanship when utilized for their intended use, in accordance with standard guidelines.

B. Warranty Period: Two Years from the date of Substantial Completion.

II PART 2 PRODUCTS

2.01 MATERIALS

A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks rolled trade names and roughness.

B. Ferrous metals shall conform to the following:

1. Schedule 80 Alloy 6061-T6
2. Steel Sections: ASTM A36.
3. Steel Tubing: Cold-formed, ASTM A500, or Hot- rolled ASTM A501.
4. Plates, Shapes and Bars: ASTM A36.
5. Pipe: ASTM A53, Type and Grade (if applicable) as selected by fabricator and as required for design loading; galvanized to G60 standards; standard weight (schedule 40), unless otherwise indicated.
6. Bolts, Nuts, and Washers: ASTM A325.
7. Welding Materials: AWS D1.1; type required for materials being welded.
8. Brackets, Flanges and Anchors: cast or formed metal of the same type material and finish as supported rails unless otherwise indicated.
9. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts washers and shims as required, hot-dip galvanized, ASTM A 153.
10. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
11. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

C. Fasteners: Provide galvanized fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

1. Bolts and Nuts: Regular hexagon head type, ASTM 325, Grade A.
2. Lag Bolts: Square head type, Federal Specification FF-B-561.
3. Machine Screws: Cadmium plated steel, Federal Specification FF-S-92.
4. Wood Screws: Flat head carbon steel, Federal Specification FF-S-111.
5. Plain Washers: Round, carbon steel, Federal Specification FF-W-92.
6. Masonry Anchorage Devices: Expansion shields, Federal Specification FF-S-325.
7. Toggle Bolts: Tumble-wing type, Federal Specification FF-B-588, type, class and style as required.
8. Lock Washers: Helical spring type carbon steel, Federal Specification FF-W-84.

2.02 FINISHES

A. Finish to be high traffic / heavy-duty “powder coating” / baked-on finish suitable for exterior exposure.

B. Color to be selected by owner from the manufacture’s full range.

2.03 ROUGH HARDWARE

A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing, for anchoring to concrete or other structures.

B. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and elsewhere, furnish steel washers.

2.04 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide miscellaneous steel framing and support shown on drawings and not specifically mentioned to be provided as part of the work of other trades.

2.05 RAILINGS

A. Railings and Handrails: Comply with applicable requirements specified elsewhere in this section for steel guardrails and handrails, and as follows:

1. Fabricate posts from solid steel pipes and top and bottom rails from tube steel pipes as shown on the drawings.

2. Railings may be mandrel bent at corners, rail returns and wall returns, instead of using prefabricated fittings.

B. Fabricate steel guardrails and handrails to comply with dimensional requirements of UFAS, 521CMR (MAAB and ADA), and design, dimensions and details indicated. In the event of a conflict, the dimensional requirements of accessibility regulations shall govern. Provide handrails and guardrail members formed from sizes and wall thickness indicated, but not less than that required to support code-required loading.

C. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

1. At tee and cross intersections provide coped joints.

2. At bends interconnect pipe by means of prefabricated elbow fittings or flush radius bends, as applicable, of radii indicated.

D. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.

E. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.

F. Close exposed ends of pipe by welding hemispherical steel plate in place or by use of prefabricated fittings.

G. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

2.06 ACCESSORIES

A. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application.

2.07 FABRICATION:

A. General: Fabricate decorative metal railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details finish and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings and guards to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
   1. Clearly mark units for reassembly and coordinated installation.
   2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.
   1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
   2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water.
   1. Provide weep holes where water may accumulate.
   2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded or mechanical connections unless otherwise indicated.

H. 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 welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.

I. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings.
   1. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
   2. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form changes in direction as follows:
   1. As detailed.

2. By bending or by inserting prefabricated elbow fittings.
3. By flush bends or by inserting prefabricated flush-elbow fittings.
4. By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated.
5. By bending to smallest radius that will not result in distortion of railing member.

K. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other Work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry Work.
1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

III PART 3 EXECUTION

3.01 EXAMINATION

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

B. Beginning of installation means erector accepts existing conditions.

C. Installation Tolerances: Structural steel and concrete slabs to be within 1/8 inch in 10 ft. horizontally and 1/8 inch vertically. Correct out-of-tolerance conditions to meet railing manufacturer's requirements.

3.02 PREPARATION

A. Clean and strip coated items to bare metal where site welding is required.

B. Supply items required to be cast into concrete with setting templates, to appropriate sections.

C. Coordinate drawings, diagrams, templates, instructions, and directions for installation of anchors, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete as masonry construction.
   1. Manufacturer shall supply all integral hardware for connection of handrail and railing to each other.
   2. Provide hardware needed to connect handrail or railing to adjoining structures.
   3. Coordinate delivery of such items to Project site.

3.03 INSTALLATION

A. General:
   1. Perform cutting, drilling, and fitting required for installing railings.
      a. Fit exposed connections together to form tight, hairline joints.
      b. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
      c. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
      d. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
      e. Set posts plumb within a tolerance of 1/16 inch in 3 ft.
      f. 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 10 ft.

   2. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

   3. Adjust railings before anchoring to ensure matching alignment at abutting joints.

   4. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on Drawings / Shop Drawings.

D. Perform field welding in accordance with AWS D1.1. Grind smooth and field galvanize all exposed welds.

E. Obtain Architect/Engineer approval prior to site cutting or making adjustments not scheduled.

F. All accessible tolerance / clearances need to be met with-in MAAB / ADA tolerances.

3.04 METAL RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2

inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.05 ANCHORING METAL POSTS

A. Form or core-drill holes in accordance with engineering requirements 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.

3.06 ATTACHING RAILINGS

A. Attach handrails to walls with wall brackets except where end flanges are used. Provide brackets with minimum of 1-1/2-inch clearance from inside face of handrail and finished wall surface.
   1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt, predrilled hole for exposed bolt anchorage.
   2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets and railing end flanges to building construction as follows:
   1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

3.07 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and to prepare test reports. Payment for these services will be made by Owner from the testing and inspecting allowance, as authorized by Change Orders.

B. Extent and Testing Methodology: Testing agency will randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Test railings in accordance with ASTM E894 and ASTM E935 for compliance with performance requirements.

C. Remove and replace railings where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to Architect and comply with specified requirements.

D. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work with specified requirements.

3.08 ADJUST AND CLEAN

A. Immediately after erection, clean field welds, bolted connections, and abraded areas of galvanizing, and re-coat exposed with field applied finish matching the railing finish in appearance and finish strength.

B. When dry, perform final cleaning of all new and adjacent surfaces.

3.09 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION
05.71.29

SECTION 06.10.00

ROUGH CARPENTRY

I. PART I - GENERAL

1.01 GENERAL

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

A. **Work included:** Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Blocking.

2. Anchors, bolts, screws, nails and other fasteners required to secure the items specified in this Section.

1.03 RELATED WORK

A. Section 02.41.00 - Selective Demolition.

1.04 REFERENCES

A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.

B. APA - American Plywood Association.

C. AWPA - American Wood Preservers' Association: Book of Standards.

D. FS - TT-W-571 - Wood Preservation: Treating Practices.

E. NFPA - National Forest Products Association.

F. SFPA - Southern Forest Products Association.

G. WCLIB - West Coast Lumber Inspection Bureau: Standard Grading Rules for West Coast Lumber.

H. WWPA - Western Wood Products Association.

1.05 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Plywood Grading Agency: Certified by APA.

1.06 SUBMITTALS

A. Submit product data under provisions of Section 01300.

II. PART II - PRODUCTS

2.01 **Blocking, furring:** construction grade Western Hemlock, Douglas Fir, Sugar or Southern Pine, 19 percent maximum moisture content.

III. PART III - EXECUTION

3.01 INSTALLATION

A. **Blocking, furring:** install in continuous pieces or the longest lengths practical. Install straight and level, to provide continuous support for other installed materials.

END OF SECTION
06.10.00

SECTION 08.14.23

DOORS AND FRAMES

I PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions, Supplementary General Conditions, and applicable parts of Division I as part of this Section.

B. This Contractor must be familiar with all other Divisions and Sections which affect this Work.

1.02 DESCRIPTION OF WORK

A. **Work included:** Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

(1.) Metal doors / frames
(2.) Insulation and flashing around doors

B. **Alternates: N/A**

C. **Items to Be Installed Only:** Install the following items as furnished by the designated Sections:

(1.) None. All items to be installed by this trade, shall be furnished by this trade.

D. **Items to Be Furnished Only:** Furnish the following items for installation by the designated Sections:

(1.) None.

E. **Related Work Specified Elsewhere:** The following items are not included in this Section, and will be performed under the designated Section:

(1.) Section 06.10.00 - ROUGH CARPENTRY for interior blocking, etc..
(2.) Section 08.71.00 - DOOR HARDWARE for entry door hardware
(3.) Section 09.91.13 - PAINTING for field finishing of factory primed items, doors, frames, etc..

1.03 REFERENCES

A. NFPA-101 Life Safety Code
B. National Wood Window and Door Association (NWWDA)
C. Underwriters' Laboratory, Inc. (UL)
D. Hinge Abuse Test: Exceeds ASTM-F-1450-A
E. State and Local codes including Authority Having Jurisdiction
F. AAMA 502 - Voluntary Spec for Field Testing of Windows and Doors
G. ASTM C 1036 – Flat Glass.
H. ASTM C 1048 – Heat-Treated Flat Glass–Kind HS, Kind FT Coated and Uncoated Glass.
I. ASTM D 1149 – Rubber Deterioration – Surface Ozone Cracking in a Chamber.
J. ASTM E 283 – Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under

Specified Pressure Difference Across the Specimen.

K. ASTM E 330 – Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

L. ASTM E 331 – Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

M. ASTM E 1300 – Standard Practice for Determining Load Resistance of Glass in Buildings.

1.04 SUBMITTALS

A. Submit under the provisions of Section 01.33.00

B. Product information indicating conformance to specified performance criteria, appearance of doors and finishes.

C. Shop drawings:
   (1.) Indicate door elevations and sections, materials, glass rated in, thickness, door swing, undercuts, storage and erection details.
   (2.) Indicate frame profiles relative to existing framed openings, including trim to be installed as specified in other Sections.
   (3.) Indicate locations of finish hardware by dimension and locations/details of all openings and glass.
   (4.) Do not proceed with any fabrication until all details are approved.
   (5.) Manufacture’s warranty.

D. Verify all dimensions in the field prior to beginning of the shop drawing phase.

1.05 QUALITY ASSURANCE

A. Door supplier to be a qualified direct distributor of products to be furnished. In addition, the distributor is to have in their regular employment an A.H.C./C.D.C. or person of equivalent experience who is to be made available at reasonable times to consult with the Architect, Contractor and/or Owner regarding any matters affecting the doors in this project.

1.06 DELIVERY, STORAGE AND HANDLING

A. Protect doors during transit, storage and handling to help prevent damage, soiling and deterioration.

B. Comply with manufacturer's instructions and with "Care and installation at site" found in NWWDA I.S.1-A section G-20.

C. Deliver pre-finished components in manufacturer's original unopened protective covering or container, clearly marked with manufacturer's name, brand name and identifying number on the covering.

D. Do not walk on or stack other materials on top of stacked doors. Do not drag doors across one another.

1.07 PROJECT/SITE CONDITIONS

A. Deliver doors to job site only after "wet" construction operations are completed.

1.08 WARRANTY

A. Manufacturer's Standard Warranty: Assemblies will be free from defects in materials and workmanship from the date of manufacture for the time periods indicated below:
   (1.) Door Slab: 10 Years.
   (2.) Door System: 10 Years.
   (3.) Auralast or Composite Frame: Lifetime.
   (4.) Steel Frame: See manufacturers separate warranty.

II PART 2 - PRODUCTS

2.01 PRE-HUNG METAL DOORS

A. MANUFACTURERS

(1.) Acceptable Manufacturer: Products specified herein are manufactured by JELD-WEN, Inc.; 2645 Silver Crescent Drive Charlotte, NC 28273; Toll Free Tel: 800-535-3936; Tel: 541-850-2606; Fax: 541-851-4333; Email: mailto:architectural_inquiries@jeld-wen.com; Web: http://www.jeld-wen.com/. Similar products by Therma-tru or Masonite (HD Series) may also be accepted upon review by architect and awarding authority.

(2.) Metal Frames.

B. STEEL DOORS

(1.) Basis of Design: Contours Steel Doors as manufactured by JELD-WEN Incorporated.
   (a.) Smooth Face.

(2.) Performance Requirements:
   (a.) Structural Design Pressure: Provide doors capable of complying with requirements indicated:
      (i.) DP-40
   (b.) NFRC Requirements: Provide doors capable of complying with the following total door ratings:
      (i.) U-Factor, in accordance with NFRC 100.
      (ii.) Solar Heat Gain Coefficient (SHGC), in accordance with NFRC 200.

   (c.) Materials:
      (i.) Composite Frames: Plastpro PF Composite Frames.
      (ii.) Composite Frames: Therma-Tru "TruGuard" Composite Frames.
      (iii.) Steel Skins: Galvanized steel. 0.0195 in (0.495 mm) plus or minus 2 percent.
      (iv.) Steel Skins: Galvanized steel. 0.0175 in (0.444 mm) plus or minus 2 percent.
      (v.) Stiles and Rails:
         a) Steel Edge Construction: Galvanized Steel; 0.028 in (0.7 mm) continuous roll- formed steel.
      (vi.) Core: Custom-fitted Polystyrene.
      (vii.) Thickness: 1-3/4 in (44 mm).
      (viii.) Edge Construction: **Steel.**

   (d.) Door Design:

(i.) Door Surface: Smooth.
(ii.) Door Shape: Squared Top.
(iii.) Door Style: Smooth
(iv.) Face Pattern: Smooth
(v.) Bottom Rail: ADA, 10-1/8 in (257 mm).
(vi.) Finish: Two-coats, low-sheen, baked-on enamel primer.
(vii.) Hardware: Prep door for hardware included in hardware section

C. GENERAL

(1.) Sizes: Indicated on drawings, to suit existing and new conditions. Verify actual rough openings in the field prior to ordering.

(2.) Layout: Door glazing layouts shall be as shown on the drawings / doors schedule.

(3.) Factory-assembled doors installed in frames.

D. EXTERIOR STEEL FRAMES *(FIELD PAINTED)*

(1.) By or matching the requirements of the door manufacturer.

(2.) Interior Frames: Fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior frame requirements.
(a.) Fabricate frames with mitered or coped and welded face corners and seamless face joints at all new walls. Frames at existing walls may be knock-down with miters field welded and filled.
(b.) Frames for Level 2 Steel Doors: 0.053-inch-thick (16 gauge) steel sheet.
(c.) Shall be for extreme / severs use.
(d.) Each unit shall be factory prepped to match the corresponding door.

(3.) Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

E. HARDWARE

(1.) Coordinate doors and frames with the Door Schedule and Section 08.14.23 Door Hardware.

F. TOLERANCES

(1.) Doors shall accommodate the following opening tolerances:
(a.) Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
(b.) Width Dimensions: Plus 1/4 inch, minus 0 inch.
(c.) Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

G. FINISH
(1.) Door Frame Finish:
(a.) Exterior / Interior surfaces: factory primed for field finish.

H. INSTALLATION ACCESSORIES

(1.) Flashing/Sealant Tape: Approved by door manufacturer.
  (a.) Aluminum-foil-backed butyl window and door flashing tape.
  (b.) Maximum Total Thickness: 0.013 inch.
  (c.) UV Resistant.
  (d.) Verify sealant comparability with sealant manufacturer.

(2.) Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

(3.) Exterior Perimeter Sealant: Approved by door manufacturer, high quality, multi-purpose sealant as specified in the joints sealant section.

III PART 3 - EXECUTION

3.01 PREPARATION

A. Examine existing and new openings and verify that the new door/frame assembly can be installed in accordance with the manufacturer's instructions. Start of installation indicates acceptance of the existing conditions.

B. Verify the existing opening is plumb and square and correct framing to plumb / level condition to accommodate a plumb and square installation.

C. Verify that the air infiltration barrier is completely installed and taped.

3.02 INSTALLATION

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

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
  (1.) Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    (a.) At fire-protection-rated openings, install frames according to NFPA 80.
    (b.) Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    (c.) Install frames with removable glazing stops located on secure side of opening.
    (d.) Install door silencers in frames before grouting.
    (e.) Remove temporary braces necessary for installation only after frames have been properly set and secured.
    (f.) Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    (g.) Field apply bituminous coating to backs of frames that are filled with grout.
  (2.) Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    (a.) Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  (3.) Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  (4.) In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on

exposed faces.

(5.) In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

(6.) Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.

(7.) Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

(a.) Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

(b.) Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

(c.) Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

(d.) Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

3.03 FINISH

A. Field painting under Section 09.90.00.

3.04 ADJUSTING AND CLEANING

A. Adjust and check each door to ensure proper operating and function.

B. Replace or rehang doors which are hinge bound and do not swing or operate freely. Replace or rehang doors which are warped, twisted, or which are not in true planes.

C. Replace hardware which does not operate freely.

D. Remove labels on glazing after inspection by building official, and clean/polish both sides of glass.

3.05 PROTECTION

A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION
08.14.23

SECTION 08.71.00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"
   c. "Stile and Rail Wood Doors"
   d. "Interior Aluminum Doors and Frames"
   e. "Aluminum-Framed Entrances and Storefronts"
   f. "Stainless Steel Doors and Frames"
   g. "Special Function Doors"
   h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.2 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.3 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:

a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
c. Indicate complete designations of each item required for each opening, include:
    1) Door Index: door number, heading number, and Architect's hardware set number.
    2) Quantity, type, style, function, size, and finish of each hardware item.
    3) Name and manufacturer of each item.
    4) Fastenings and other pertinent information.
    5) Location of each hardware set cross-referenced to indications on Drawings.
    6) Explanation of all abbreviations, symbols, and codes contained in schedule.
    7) Mounting locations for hardware.
    8) Door and frame sizes and materials.
    9) Degree of door swing and handing.
    10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:
    a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
    b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
    c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
    d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
    e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
    f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
    a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
    b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
    a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
    b. Catalog pages for each product.
    c. Final approved hardware schedule edited to reflect conditions as installed.
    d. Final keying schedule
    e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
    f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

1.4 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
   b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

4. Accessibility Requirements:

a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.6 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.7 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    a. Mechanical Warranty
        1) Locks
            a) Falcon: 10 years
        2) Exit Devices
            a) Falcon: 10 years
        3) Closers
            a) Falcon SC Series: 10 years

1.8 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.3 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. ABH
   b. Hager

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.4 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Falcon 24/25 series

2. Acceptable Manufacturers and Products:
   a. Corbin Russwin ED 5000 Series
   b. Precision Apex series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide flush end caps for exit devices.
7. Provide exit devices with manufacturer's approved strikes.
8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
11. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide electrified options as scheduled.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.5 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. TO MATCH OWNER'S CORBIN RUSSWIN SYSTEM

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.6 KEYING

A. Scheduled System:

1. Existing non-factory registered system:
   a. Provide cylinders/cores keyed into Owner's existing keying system. Complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
   a. Temporary Construction Cylinder Keying.
      1) Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements.
         a) 3 construction control keys, and extractor tools or keys as required to void construction keying.
         b) 12 construction change (day) keys.
      2) Owner or Owner's Representative will void operation of temporary construction keys.
   b. Replaceable Construction Cores.
      1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
         a) 3 construction control keys
         b) 12 construction change (day) keys.
      2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:
   a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
      1) Master Keying system as directed by the Owner.
   b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   c. Provide keys with the following features:
      1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
      2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
      3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.
   d. Identification:

1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
2) Identification stamping provisions must be approved by the Architect and Owner.
3) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
4) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

e. Quantity: Furnish in the following quantities.
1) Permanent Control Keys: 3.
2) Master Keys: 6.
3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
4) Key Blanks: Quantity as determined in the keying meeting.

2.7 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Telkee

2. Acceptable Manufacturers:
   a. HPC
   b. Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
   a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
   b. Provide hinged-panel type cabinet for wall mounting.

2.8 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Falcon SC70A series

2. Acceptable Manufacturers and Products:
   a. Corbin Russwin DC8000 Series
   b. Dormakaba 8900

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 5/8-inch (16 mm) diameter heat-treated pinion journal.

4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.9 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Trimco
   b. Rockwood

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.10 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Zero International

2. Acceptable Manufacturers:
   a. National Guard
   b. Reese
   c. DHSI
   d. Legacy
   e. Pemko

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.11 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Connections to panel interface modules, controllers, and gateways.
6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

Q. 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.

R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.3 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.5 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

119261 X-108753 Version 1

Legend:
Link to catalog cut sheet

Hardware Group No. 01

For use on Door #(s):
101 102

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		MFR
2	EA	CONT. HINGE	112XY		IVE
1	EA	REMOVABLE MULLION	KR4023 STAB		FAL
1	EA	PANIC HARDWARE	25-R-EO		FAL
1	EA	PANIC HARDWARE	25-R-NL		FAL
2	EA	CORE	MATCH CORBIN RUSSWIN EXISTING SYSTEM		C-R
2	EA	RIM OR MORTISE CYLINDER	MATCH CORBIN RUSSWIN EXISTING SYSTEM		C-R
2	EA	SURFACE CLOSER	SC71A SSHO		FAL
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		IVE
1	EA	RAIN DRIP	142AA 6"		ZER
1	EA	GASKETING	429AA		ZER
1	EA	MULLION SEAL	8780NBK PSA		ZER
2	EA	DOOR SWEEP	39A		ZER
1	EA	THRESHOLD	8726A		ZER

REMOVABLE MULLION TO BE PAINTED IN FIELD TO MATCH FINISH.

END OF SECTION
08.71.00

SECTION 09.90.00

PAINTING

I PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The General Conditions, Supplementary General Conditions, and applicable parts of Division I as part of this Section.

B. This Contractor must be familiar with all other Divisions and Sections which affect this Work.

1.02 DESCRIPTION OF WORK

A. **Work included:** Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

(1.) The work consists of the following major items:
- (a.) Field painting of new factory primed metal doors and frames.
- (b.) Field painting of new factory primed railing system.
- (c.) Caulking around dissimilar materials, door frames / masory, etc.
- (d.) Priming of all surfaces to receive paint.
- (e.) Preparation of all items to be painted.
- (f.) Painting surfaces as scheduled herein.
- (g.) Protection of all items which may be affected by the work of this section.
- (h.) Cutting and Patching as included in Section 01.73.29.
- (i.) All other items shown on the drawings to be painted.

B. **Alternates: N/A**

C. **Items to Be Installed Only:** Install the following items as furnished by the designated Sections:

(1.) None. All items to be installed by this trade, shall be furnished by this trade.

D. **Items to Be Furnished Only:** Furnish the following items for installation by the designated Sections:

(1.) None.

E. **Related Work Specified Elsewhere:** The following items are not included in this Section, and will be performed under the designated Section:

(1.) Painting of new enclosures and items included in the MEP sections. Coordinate.

(2.) New doors shall be pre-primed per Section 08.10.00.

(3.) Caulking flanges and portions to be concealed during the installation of new doors, windows and related trim, shall be installed by the trades installing those components, as the work progresses.

1.03 SUBMITTALS

A. Submit product data on all finishing products under provisions of Section 01.33.00.

B. Submit one complete fan deck for color selection.

1.04 DELIVERY, STORAGE, AND HANDLING

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

B. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in well ventilated area, unless required otherwise by manufacturer's instructions.

D. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F (7 degrees C) for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish and Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.

1.06 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

C. Mockups: Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

(1.) Designer will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
(a.) Wall Surfaces: Provide samples on at least 4 sq. ft.
(b.) Small Areas and Items: Designer will designate items or areas required.

(2.) Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.

(a.) After finishes are accepted, Designer will use the room or surface to evaluate coating systems of a similar nature.

(3.) Final approval of colors will be from benchmark samples.

1.07 WARRANTY

A. Contractor shall warranty the finishes applied for a period of one year from final completion, and make any repairs required due to blistering, peeling or other such failures of the finish.

II PART 2 PRODUCTS

2.01 MANUFACTURERS

A. All materials specified in the painting schedule are **Benjamin Moore** Paints.

B. **ICI, Pratt & Lambert or Sherwin Williams** paints may be used may be used of the same quality or better.

2.02 MATERIALS

A. Coatings: 100% Acrylic paint for all. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating with a good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.03 ACCESSORY MATERIALS

A. Caulking: DAP “Kwik-Seal Plus” or approved equal siliconized latex caulk with integral anti-microbial additive, white, suitable for painting.

B. Include an “Anti-Mildew” additive in the paint specified for the Bathroom.

III PART 3 EXECUTION

3.01 INSPECTION

A. Surface to be painted must be clean, dry and in sound conditions. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

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

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Beginning of installation means acceptance of existing surfaces.

3.02 PREPARATION

A. Correct minor defects and clean surfaces which affect work of this Section.

B. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after

repairs.

C. Touch up any voids in sealant placed by others, prior to painting.

D. Pre-primed metal doors and frames scheduled for Painting: Seal top and bottom edges with primer.

E. Pre-primed railing system scheduled for painting, all surfaces.

F. Caulk the following joints at surfaces scheduled for painting, prior to painting:
(1.) Door frames (frame-to-wall).

3.03 COORDINATION AND PROTECTION

A. Coordinate painting of exterior electrical items to occur after demolition of siding but prior to installation of new siding, to minimize the chance for spills or drips on new siding.

B. Painter to provide all required protections for work surrounding areas to be painted, and will be responsible for any cleaning required, or replacement of materials that cannot be completely cleaned. Furnish drop cloths, shields, and protective methods to prevent splatter or droppings from disfiguring other surfaces.

C. Protect elements surrounding the work of this Section from damage or disfiguration.

D. Repair damage to other surfaces caused by work of this Section.

3.04 APPLICATION COATINGS

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Sand lightly between coats to achieve required finish.

E. Allow applied coat to dry before next coat is applied.

F. The application of the final coat and of any touch-up paint should be done under conditions that reflect the manufacturer’s recommendations regarding weather conditions and temperature.

3.05 CLEANING

A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

D. Remove empty paint containers from site. Deliver unused paint to Owner.

3.06 CLOSE OUT

A. Furnish a typewritten list of all paint products used, including the paint codes required for mixing future matches. GC to include list in close out manuals.

3.07 PAINT SCHEDULE

A. **Metal Doors and Metal Frames:**

(1.) Shop Primed Steel.
- (a.) Surface preparation: Solvent Clean per SSPC-SP1 (Corotech Oil & Grease Emulsifier)
- (b.) First Coat - Benjamin Moore Ultra Spec HP Acrylic Metal Primer
- (c.) Second and Third Coats - Benjamin Moore Ultra Spec HP D.T.M. Acrylic Enamel
- (d.) Color: to be selected by Owner.
- (e.) Finish: Semi-Gloss

END OF SECTION
09.90.00

EMSL Analytical, Inc.
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EMSL Order: 032406379
Customer ID: ATC62
Customer PO: 11-81-0030
Project ID:

Attention: Derrick Wissman
Atlas Technical
73 William Franks Drive
West Springfield, MA 01089

Phone: (413) 781-0070
Fax: (413) 781-3734
Received Date: 05/22/2024 10:10 AM
Analysis Date: 05/29/2024
Collected Date: 05/21/2024

Project: 183DW24083/ Fanning Building/ 24 Chatham St Worcester

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
FB-1a *032406379-0001*	Rear Entry Doors - White Remnant Exterior Door Caulk	White Non-Fibrous Homogeneous		97.0% Non-fibrous (Other)	**3% Chrysotile**
FB-1b *032406379-0002*	Rear Entry Doors - White Remnant Exterior Door Caulk				**Positive Stop (Not Analyzed)**
FB-2a *032406379-0003*	Rear Entry Doors - Black Remnant Exterior Door Caulk	Black Non-Fibrous Homogeneous		80.0% Non-fibrous (Other)	**20% Chrysotile**
FB-2b *032406379-0004*	Rear Entry Doors - Black Remnant Exterior Door Caulk				**Positive Stop (Not Analyzed)**
FB-3a *032406379-0005*	Rear Entry Doors - Grey Exterior Door Caulk	Gray Non-Fibrous Homogeneous		97.0% Non-fibrous (Other)	**3% Chrysotile**
FB-3b *032406379-0006*	Rear Entry Doors - Grey Exterior Door Caulk				**Positive Stop (Not Analyzed)**
FB-4a *032406379-0007*	Rear Entry Doors - Grey Interior Door Caulk	White Non-Fibrous Homogeneous		7% Quartz 50% Ca Carbonate 38.0% Non-fibrous (Other)	**5% Chrysotile**
FB-4b *032406379-0008*	Rear Entry Doors - Grey Interior Door Caulk				**Positive Stop (Not Analyzed)**
FB-5a *032406379-0009*	Gym - Yellow Ceramic Floor Tile	Brown/Tan Non-Fibrous Homogeneous	10% Cellulose	30% Ca Carbonate 60.0% Non-fibrous (Other)	**None Detected**

Initial report from: 05/29/2024 17:31:24

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10-39 45th Road Long Island City, NY 11101
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Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
FB-5b *032406379-0010*	Gym - Yellow Ceramic Floor Tile	Orange Non-Fibrous Homogeneous	10% Cellulose	5% Quartz 45% Ca Carbonate 40.0% Non-fibrous (Other)	**None Detected**
FB-6a *032406379-0011*	Gym - Grey Thinset Associated with 5a + 5b	Gray Non-Fibrous Homogeneous		20% Quartz 45% Ca Carbonate 3% Mica 30.0% Non-fibrous (Other)	**2% Chrysotile**
FB-6b *032406379-0012*	Gym - Grey Thinset Associated with 5a + 5b				**Positive Stop (Not Analyzed)**

Initial report from: 05/29/2024 17:31:24

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EMSL Order:	032406379
Customer ID:	ATC62
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Attention: Derrick Wissman
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Phone:	(413) 781-0070
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Received Date:	05/22/2024 10:10 AM
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Project: 183DW24083/ Fanning Building/ 24 Chatham St Worcester

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk materials via EPA/600 (0513) Method using Polarized Light Microscopy. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date:	05/22/2024	Sample Receipt Time:	10:10 AM
Analysis Completed Date:	05/29/2024	Analysis Completed Time:	4:49 PM

Analyst(s):

Kerrie Gibson

Kerrie Gibson PLM (3)

M. Fragoso

Madison Fragoso PLM (4)

Samples Reviewed and approved by:

Charles Johnson, Asbestos Laboratory Manager
or other approved signatory

Initial report from: 05/29/2024 17:31:24