

<u>REQUEST</u>

<u>FOR</u>

BIDS

RENOVATION OF TWO SCIENCE LABS

<u>at</u>

RIVER VALLEY COMMUNITY COLLEGE

1 COLLEGE PLACE, CLAREMONT, NH 03743

A COMPONENT OF THE

Community College System of New Hampshire

26 College Drive, Concord, NH

Project# RVC23-01

March 24, 2023

DOCUMENT 00015

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SECTION 00010 - INVITATION TO BID - CCSNH

Electronic Bids per the Project Manual Technical Specifications will be accepted by email to Matthew Moore, Director of Capital Planning and Development at <u>memoore@ccsnh.edu</u> until **August 17, 2023 at 2:00pm** for the following project:

Renovation of Two Science Labs at River Valley Community College, 1 College Place, Claremont, NH 03743 a Component of the Community College System of New Hampshire 26 College Drive, Concord, NH

Project # RVC23-01

Description:

This project consists of renovation of two Second Floor science lab rooms 203 (1,172 SF) and 224 (1,066 SF) per attached Drawings and Specifications.

Scope:. The architectural work of the contract can be summarized as: architectural, mechanical and electrical. the general construction includes steel framing, doors & hollow metal frames, partition framing, painting, wood doors, hardware, ceilings, millwork and floor finishes.

The Project will include but not be limited to the Disciplines of: General Construction: Metal Framing, Mechanical, Electrical.

Plans and specifications will be available from the Community College System of New Hampshire, **July 27**, **2023 on the CCSNH website** <u>https://www.ccsnh.edu/about-ccsnh/bidding-rfp/</u>

Plans and specifications will also be available at the following printers:

- Construction Summary of NH: Inc., 734 Chestnut Street, Manchester, NH 03104;
- Infinite Imaging: 933 Islington Street, Portsmouth, NH 03801
- Minuteman Press: 109 Gosling Road, Newington, NH 03801;
- The Blue Book, http://www.thebluebook.com/
- Community College System of New Hampshire website https://www.ccsnh.edu/about-ccsnh/bidding-rfp/

BIDDERS SHOULD ACT PROMPTLY AND SUBMIT ALL QUESTIONS IN WRITING TO: MATTHEW MOORE, DIRECTOR OF CAPITAL PLANNING AND DEVELOPMENT, E-MAIL <u>memoore@ccsnh.edu</u>.

A MANDITORY SITE VISIT WILL NOT BE HELD.

To schedule a non-mandatory site visit call Jason Thornton at RVCC at 603.543.7569

The Asbestos removal and demolition will be starting August 7th for about three weeks. The two rooms will be sealed for containment so the only opportunity for a physical site visit will be before August 7th during the bidding period. You'd have to rely on the pictures, prior to demo, on our RFP website. Project Substantial Completion Date for work: December 15, 2023

Proposals must be completed in both words and figures on forms furnished by the College, or on previouslyapproved, substantially-identical forms generated by computer software, which shall be submitted electronically in an e-mail titled: **"Bid for: Renovation of Two Science Labs RVC23-01"** received by MATTHEW MOORE at <u>memoore@ccsnh.edu</u> as specified no later than **2:00 PM**, **August 17, 2023**.

Companies, corporations or trade names, except sole proprietorships must be registered with the Secretary of State (Corporate Division, Telephone No. 603/271-3244) in order to do business with the State of New Hampshire.

Bidders must show three recent years' experience with installations of a similar complexity and cost and prior experience with installations of the materials within 50 miles of the project site.

The successful bidder will be required to comply with State of New Hampshire RSA#21-1:81-a. The successful bidder will be required to furnish a 100% payment and 100% performance bond prior to execution of contract.

The award will be based on the proposal that best meets the needs of the college. Factors included will be the cost, completeness of the proposal, quality of the technology provided, and experience of the contractor and installation team. The college reserves the right to waive any informality in or to reject any or all proposals.

All contract documents can be found on the CCSNH website at <u>https://www.ccsnh.edu/about-ccsnh/bidding-rfp/</u> <u>Before your submission</u>, always check for any addenda or other materials that may have been issued which would affect the invitation to bid by checking the CCSNH website at <u>https://www.ccsnh.edu/about-ccsnh/bidding-rfp/</u>

CCSNH reserves the right to waive any and all informalities in its best interest or to reject any or all proposals.

Mathen & Moore

Matthew Moore, PE, Contract Representative Director of Capital Planning & Development Community College System of New Hampshire

END OF DOCUMENT

DOCUMENT 001153 - REQUEST FOR QUALIFICATIONS

1.1 PURPOSE, LAWS, AND REGULATIONS

A. The purpose of the Prequalification Procedure described in this Document is to provide Owner with a mechanism to evaluate and determine whether Prospective Bidders are qualified to participate in the construction of Project. Evaluation will be limited to that office of the Prospective Bidder that is proposed to perform the Work.

1.2 DEFINITIONS

A. Prospective Bidder: A Prospective Bidder is a person or entity who submits a Submittal of Qualifications to Owner.

1.3 QUALIFICATION PROCEDURES

- A. Prospective Bidders shall complete all required forms and attachments described in the Prequalification Documents, entering "Not Applicable" where information does not apply. Absence of any of the forms included in the Prequalification Documents will be reason for possible disqualification. All required qualification forms to be submitted with Bid forms.
- B. Status of Prospective Bidders:
 - 1. Proprietors submitting bids shall indicate their status as proprietors.
 - 2. Prospective Bidders submitting qualifications for partnerships shall indicate their status as partners and shall submit a certified copy of the power of attorney authorizing the executor of the submittal to bind the partnership.
 - 3. Prospective Bidders submitting qualifications for corporations shall indicate their status as corporations and shall submit a certified copy of the board of directors' authorization for the Prospective Bidder to bind the corporation and shall affix the corporate seal on the submittal.
 - 4. Prospective Bidders shall provide the following:
 - a. Names and addresses of proprietors, of all members of a partnership, or of the corporation's officers.
 - b. Name of jurisdiction where the partnership is registered or where the corporation is incorporated. Corporations must be licensed to do business in Project state at the time of executing the Contract.

1.4 WITHDRAWAL

A. A Qualification Statement may be withdrawn on personal request received from the Prospective Bidder.

1.5 QUALIFICATION STATEMENT

- A. The undersigned submits answers to the following questions to enable the Community College System of New Hampshire to judge experience and ability in the work proposed to be done.
 - 1. The work, if awarded to you, will have the resident personal supervision of whom? State his/her name, title, and their special qualifications.

- 2. (a) Provide a brief history of your firm. (b) Demonstrate that your firm has provided satisfactory work on similar projects.
- 3. How many years has your organization been in business as a contractor under the name in which you propose to execute this contract?
- 4. Has your present organization ever failed to complete any work awarded to it? If so, state when, where and why:
- 5. Provide three (3) Examples of Experience with full responsibility for work of a similar size to this project and within 50 miles of the project site.

Qualifications to perform the work: List Three

Experience with full responsibility for work of a similar size and within 50 miles of the project site. Bidders are to provide evidence of qualifications with the bid.

NAME OF REFERENCE PROJECT		
Location of Project		
Date work performed		
Name of Owner Contact Name & Phone Number		
Description of Project		
Approx. Contract value		
NAME OF REFERENCE PROJECT	<u> </u>	
Location of Project		
Date work performed	<u> </u>	
Name of Owner Contact Name & Phone Number		
Description of Project		
Approx. Contract value		
NAME OF REFERENCE PROJECT		
Location of Project		
Date work performed		
Name of Owner Contact Name & Phone Number		
Description of Project		
Approx. Contract value		

DOCUMENT 00204

INSTRUCTIONS TO BIDDERS – Community College System of New Hampshire (CCSNH) Issued 2-05-2004; Revised as noted

PART	ITEM
1	DEFINITIONS
2	PREPARATION AND SUBMISSION OF BIDS
3	RECEIPT AND OPENING OF BIDS
4	WITHDRAWAL OF BIDS
5	PROPOSAL GUARANTY (intentionally omitted)
6	CONDITIONS AT SITE OR BUILDING
7	EXPLANATION TO BIDDERS
8	REJECTION OF BIDS
9	CONTRACT BOND
10	CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE
11	BIDDING DOCUMENTS
12	SUBSTITUTIONS
13	AWARD OF CONTRACT
14	PERMITS AND FEES

PART 1 DEFINITIONS

1.1 Refer to Document 00708: General Conditions – CCSNH:

PART 2 PREPARATION AND SUBMISSION OF BIDS

- 2.1 The Bidder is required to bid on all items called for in the Proposal. If Alternates are included, the Bidder shall set forth in the space provided the amount to be added to or deducted from the Lump Sum Base Bid or the Lump Sum Grand Total. If an Alternate called for does not involve a change in price, the Bidder shall so indicate in the space provided.
- 2.2 Bids shall be submitted upon the Proposal Form furnished and shall be signed in ink. The Bidder shall specify a unit price, both in words and figures, for each item called for in the Lump Sum Grand Total Proposal. All of the words and figures shall be in ink or typed. If a unit price or a Lump Sum Grand Total already entered by the Bidder on the Proposal Form is to be altered, it should be crossed out with ink, the new unit price and the Lump Sum Grand Total bid entered above or below it and initialed by the Bidder; also in ink. In case of discrepancy between the prices written in words and those written in figures, the prices written in words shall govern. Bids containing any conditions, omissions, unexplained erasures or alterations, or items not called for in the Proposal or irregularities of any kind may be rejected by the Chancellor as being incomplete non-conforming, or non-responsive. All required qualification forms to be submitted with Bid forms.
- 2.3 Each bid must contain the full business address of the Bidder and be signed by him/her with his/her usual signature.
 - A. Bids by a partnership of any form must furnish the full names of all partners, and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the designation of the person signing. All Contracts with partnerships must include a certificate of authorization demonstrating that the partner(s) or authorized individuals have been authorized by the partnership to enter into the Contract on behalf of the partnership.
 - B. Bids by a corporation of any form must be signed with the legal name of the corporation, followed by the name of the State of incorporation and by the signature and designation of the president, secretary or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. [A bid by a person who affixes to his/her signature, the word "President," "Secretary," "Agent" or other designation, without disclosing whom he/she is representing if other than the contracting entity noted above, may be held to the bid of the individual signing.]
 - C. Bids by proprietorships (individuals), or by individuals with a registered trade name, or doing business under an assumed name (aka d/b/a), shall be executed by the individual in their name, with reference to the trade name or assumed name.

2.4 Bids to be scanned and transmitted by electronic mail to <u>memoore@ccsnh.edu</u> no later than the bid deadline.

PART 3 RECEIPT AND OPENING OF BIDS

3.1 The bid opening officer will decide when the specified time has arrived, and no bid received or presented thereafter will be considered. No responsibility or liability will be attached to any officer for the premature opening of a bid not properly addressed and identified.

PART 4 WITHDRAWAL OF BIDS

4.1 A bid may be withdrawn upon written request received from the bidder at the Director of Capital Planning and Development office at 26 College Drive, Concord, NH 03301-7407, with reasonable time prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

PART 5 PROPOSAL GUARANTY (intentionally omitted)

PART 6 CONDITIONS AT SITE OR BUILDING

6.1 Bidders shall visit the site and be responsible for having ascertained pertinent local conditions; such as location, accessibility and general character of the site or building, the character and extent of existing work within or adjacent to the site, and any other work being performed thereon at the time of submitting the bid.

PART 7 EXPLANATION TO BIDDERS

7.1 No oral explanation in regard to the meaning of the Bidding Documents will be made and no oral instructions will be given before the award of the Contract. Discrepancies, omissions or doubts as to the meanings of Bidding Documents shall be communicated in writing to the Director of Capital Planning and Development for interpretation no later than five (5) working days before the hour and date set for the bid opening. Any interpretations will be in the form of an Addendum to the Bidding Documents that will be forwarded to all Bidders of record and sent to all other locations identified in the Invitation to Bid where documents are made available.

PART 8 REJECTION OF BIDS

- 8.1 The Chancellor reserves the right to reject any or all bids, to waive technicalities or to advertise for new bids, if in his/her judgment, the best interests of the State will be promoted thereby. The Chancellor reserves the right to reject the bid of a Bidder who is not in a position to perform the Contract.
- 8.2 The Chancellor reserves the right to waive any informality in bids received, if in the best interest of the CCSNH.
- 8.3 The Chancellor reserves the right to reject any Bidders not meeting all stated requirements.

PART 9 CONTRACT BOND

9.1 The successful Bidder, at the time of the execution of the Contract, must deposit with the Chancellor, Surety in the sum equal to one hundred percent (100%) of the amount of the Contract as required by RSA 447:16. The form of Bond shall be that provided for by the CCSNH and the Surety shall be acceptable to the Chancellor. The Contract Bond must be written by a Company licensed to do business in New Hampshire at the time the policy is issued. In addition, the Company issuing the bond shall be listed on the current list of "Surety Companies Acceptable on Federal Bonds" as published by the U.S. Department of the Treasury, Financial Management Services, Circular Number 570. see http://www.fms.treas.gov/c570/index.html

PART 10 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

- The Contractor shall deliver to the Chancellor at the time of submitting a signed Contract, 10.1 certificates of all insurance required hereunder. The certificates of insurance shall contain a description of the project, including the project name and number, and shall state that the companies issuing insurance will mail to the Chancellor thirty (30) days' notice of cancellation, alteration of material change of any listed policies or ten (10) days in cases of non-payment of premium. The Contractor shall keep in force the insurance required herein for the period of the Contract, through the Warranty period. and Owners and Contractors Protective (OCP) Liability coverage shall be kept in force through the date of Substantial Completion, or longer at the Director of Capital Planning and Development's direction. The Contractor shall have a continuing duty to provide new certificates of insurance as policies are amended or renewed. At the request of the Chancellor, the Contractor shall promptly make available a copy of any and all listed insurance policies. The required insurance must be written by a Company licensed to do business in the State of New Hampshire at the time the policy is issued. In addition, the company must have a rating of no less than A- based on the current A.M. Best with a size of VIII and satisfying and the terms and conditions described below or the minimum limits required of the Prime Contractor under the Contract Documents.
- 10.2 Prior to the start of the Contractor's Work, the Contractor and any subcontractors, consultants or third parties approved to perform Services pursuant to this contract, will carry, in full force and effect during the entire term of this Agreement, insurance with a carrier rated at minimum "A-" by A.M. Best with a size of VIII and satisfying and the terms and conditions described below or the minimum limits required of Prime Contractor under the Contract Documents.
 - A. Commercial General Liability (CGL) with limits of Insurance of not less than \$1,000,000 each occurrence and \$2,000,000 Annual Aggregate.
 - .1) If the CGL coverage contains a General Aggregate Limit, such General Aggregate shall apply separately to each project.
 - .2) CGL coverage shall be written on ISO Occurrence form CG 00 01 (10/93) or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products- completed operations, and personal and advertising injury.
 - .3) Owner and all other parties required of the Contractor, shall be included as insured's on the CGL, using ISO Additional Insured Endorsement CG 20 10 (11/85) or CG 2010 (10/93) **AND** CG 20 37 (10/01) or CG2033(10/01) **AND** CG2037 (10/01) or an endorsement providing equivalent coverage to the additional insured's. This insurance for the additional insured's shall be as broad as the coverage provided for the named insured Contractor. It shall apply as Primary and non-contributing Insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, the additional insured.
 - .4) Contractor shall maintain CGL coverage for itself and all additional insured's for the duration of the project and maintain Completed Operations coverage for itself and each additional insured for at least 7 years after completion of the Work.

- .5) If Contractor is performing snow removal the policy must include the addition of CG 22 92 12 07 for Snow Removal Operations Coverage or equivalent
- 10.3 Commercial Automobile Liability

.1) Business Auto Liability with limits of at least \$1,000,000 for each accident.

.2) Business Auto coverage must include coverage for liability arising out of all owned, leased, hired and non-owned automobiles.

.3) Owner and all other parties required of the Contractor, shall be included as additional insured's on the auto policy.

- 10.4 Commercial Umbrella
 - .1) Umbrella limits must be at least \$2,000,000.

.2) Umbrella coverage must include as insured's all entities that are additional insured's on the CGL and coverage shall be as broad as provided on the underlying coverages.

10.5 Workers Compensation and Employers Liability

.1) Employers Liability Insurance limits of at least \$500,000 each accident for bodily injury by accident and \$500,000 each employee for injury by disease.

- .2) Where applicable, U.S. Longshore and Harborworkers Compensation Act Endorsement shall be attached to the policy.
- .3) Where applicable, the Maritime Coverage Endorsement shall be attached to the Policy.
- .4) All employees, including the Owner, partners and officers, shall provide proof of workers' compensation coverage prior to working on the job site.

10.6 Waiver of Subrogation

.1) To the fullest extent permitted by law, Contractor waives all rights against Owner and Architect and their agents, officers, directors and employees for recovery of damages to the extent these damages are covered by commercial general liability, commercial umbrella liability, business auto liability or workers compensation and employers liability insurance where acceptable by law.

10.7 Pollution Liability Insurance

.1) Pollution Limits with at least \$1,000,000 each occurrence, claim or wrongful act with an aggregate of \$1,000,000 for bodily injury, property damage, pollution or environmental harm arising out of the work, asbestos, lead, or silica related claims, claims arising out of microbial matter or bacteria, testing, monitoring, measuring operations or laboratory analyses, or liability arising out of treatment facility. If a motor vehicle is used in connection with the work,

the business automobile policy will include coverage at least as broad as ISO CA 99 48 and be endorsed to include Motor Carrier Act Endorsement MCS 90.

.2) The policy must meet all other insurance requirements applicable to general liability, including, but not limited to additional insured, waiver of subrogation and cancellation notification.

.3) If there is a retroactive date, claims made will apply back to the first date of services provided to the Owner.

.4) The coverage shall be effective for 5 years following completion of the engagement.

.5) Proof of Pollution Liability Insurance shall be provided on a certificate acceptable to the Owner.

10.8 Attached to each certificate of insurance shall be a copy of the Additional Insured Endorsement that is part of the Contractor's Commercial General Liability Policy. These certificates and the insurance policies required shall contain a provision that coverage afforded under the policies will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner. Any subcontractors, consultants or third parties performing services for Contractor as contemplated herein, shall also maintain insurance as required above. Notwithstanding the foregoing, the Owner, in its sole and absolute discretion and taking into account the scope and character of the Services to be provided by Contractor, may reduce the required liability insurance minimums. Such reduction in the required liability insurance minimum of Contractor

shall be evidence by a written instrument specifically referencing this Exhibit I and signed by the Owner.

- 10.9 The Contractor shall require each Subcontractor employed on the Project to maintain the coverage listed above unless the Contractor's insurance covers activities of the Subcontractor on the Project.
- 10.10 No operations under this Contract shall commence until certificates of insurance attesting to the above listed requirements have been filed with the Chancellor and a Notice to Proceed is issued.
 - A. If blasting and/or demolition is required by the Contract, the Contractor or subcontractor shall obtain the respective coverage for those activities, and shall furnish to the Chancellor a Certificate of Insurance evidencing the required coverages prior to commencement of any operations involving blasting or demolition or both.
 - B. Owner's and Contractor's Protective Liability (OCP) coverage for the benefit of the Community College System of New Hampshire.
 - 1. Limits of Liability:
 - a. \$2,000,000 Each Occurrence
 - b. \$3,000,000 Aggregate

***** [OR] *****

- c. \$2,000,000 Bodily Injury & Property
- C. Property and Builder's Risk Insurance (Fire and Extended Coverage):
 - 1. The Community College System of New Hampshire shall insure the work included in the Contract, including extras and change orders, on an "All Risk" basis, on one hundred percent (100%) completed value basis of the Contract, as modified. Builder's Risk coverage shall include materials located at the Contractor's premises, on-site, in-transit, and at any temporary site. The policy by its own terms or by endorsement shall specifically permit partial or beneficiary occupancy prior to completion or acceptance of the entire work. The policies shall be in the names of the Community College System of New Hampshire and the Contractor. The policies shall provide for the inclusion of the names of all other Contractors, Subcontractors, and others employed on the premises as insureds. The policies shall stipulate that the insurance companies shall have no right of subrogation against any Contractors, Subcontractors or other parties employed on the premises.
 - 2. CCSNH is not responsible to insure Contractor's owned or leased equipment/property.
- D. General Insurance Conditions
 - 1. Failure to secure and maintain, or add by endorsement, Owner and all subsidiaries, agents, and employees as required shall not act as a defense to the enforcement of the terms of this Contract. Any such insurance policy shall apply separately to each insured against whom claim is made or suit is brought and shall contain no provision which excludes coverage of a claim made by one insured under the policy against another insured under the policy.
 - 2. Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than thirty (30) days or ten (10) days in cases of non-payment of premium after written notice thereof has been received by CCSNH.

- E. Indemnification:
 - 1. To the fullest extent of the law the Contractor shall indemnify, defend, and hold harmless the Community College System of New Hampshire, its Officers, and its agents and employees from and against any and all claims, liabilities, suits or penalties arising out of (or which may be claimed to arise out of) acts or omissions of the Contractor or subcontractors in the performance of work covered by the Contract. This covenant shall survive the termination of the Contract. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the Community College System of New Hampshire, which immunity is hereby reserved by the Community College System of New Hampshire. The covenant in paragraph I shall survive the termination of this Agreement.
- F. Additional Insurance for Design/Build Contracts:
 - In addition to the insurance requirements listed in the above paragraphs, the Designer/Builder Team shall provide the following coverage.
 - a. The Designer/Builder Team, or the Designer shall purchase and maintain professional liability coverage for this project. The coverage shall provide the CCSNH with protection against design errors and omissions and shall have an annual aggregate limit of no less than \$2,000,000. The coverage shall be maintained through the legal stature of repose period, currently stipulated to be three (3) years from the date of Substantial Completion. If the professional liability coverage is maintained by other than the firm holding the prime contract with the CCSNH for this project, the prime contractor shall provide evidence of indemnifications, approved by the CCSNH, that indicate that this insurance coverage is in place and available for the protection of the CCSNH. The indemnification may not create a re-assignment of contractual responsibilities between the CCSNH and the prime contractor.

PART 11 BIDDING DOCUMENTS

1.

11.1 Bidders shall use only complete sets of Bidding Documents in preparation of bids; the CCSNH assumes no responsibility for mistakes due to the use of incomplete sets of Bidding Documents.

PART 12 SUBSTITUTIONS

12.1 Where Bidding Documents stipulate particular Products, substitution requests will ONLY be considered before receipt of Bids. Refer to specification section 01600 – Product Requirements.

PART 13 AWARD OF CONTRACT

- 13.1 The Contract will be Awarded as soon as possible to the Responsible Bidder on the basis of the Highest Score, see Score Sheet in Section 00300.
 - A. The CCSNH may request a Negotiated Price from the Highest Score Responsible Bidder.

- 13.2 The signed Contract, together with the Contract Bond, and certificate of insurance shall be returned to the CCSNH within 10 days after the date of notice that the Proposal has been accepted.
 - A. If the successful bidder fails to execute the Contract and submit acceptable bond and required attachments within 20 days after the date of notice of acceptance of the Proposal, the CCSNH may cancel the notice of award. Contract award may then be made to the next lowest responsible bidder or the Work may be re-advertised.
- 13.3 Prior to the issuance of Notice to Proceed, each Bidder shall be prepared, if so requested by the Chancellor, to present evidence of his/her experience, qualifications, and financial ability to carry out the terms of the Contract.
- 13.4 A Contract that has been Awarded with required attachments is not executed until submitted and approved by the CCSNH Board of Trustees, if required, and issuance of the Notice to Proceed by the CCSNH.

PART 14 PERMITS AND FEES

14.1 CCSNH shall secure and pay for all Permits and Fees required by the Work of this Contract.

END OF DOCUMENT 002004

SECTION 00300 - BID PROPOSAL FORM - CCSNH

PROPOSAL – STIPULATED BASE LUMP SUM GRAND TOTAL BID – GENERAL CONSTRUCTION

PROPOSAL TO:	Received no later than Thursday, August 17, 2023 at 2:00pm Matthew Moore, PE <u>memoore@ccsnh.edu</u> Director of Capital Planning & Development Community College System of New Hampshire 26 College Drive Concord, New Hampshire 03301
SUBJECT:	Project # RVC23-01 Renovation of Two Science Labs
1. <u>CERTIFICA</u>	TION: The undersigned Prime Contractor
Name of Firm	n:
Address of F	irm:
Phone Numb	er:
Email:	
Signature:	
Name and Ti	tle:
	(Contractor's Name Printed Here

(Contractor's Name Printed Here)

certifies that they have examined and fully comprehend the requirements and intent of the Bidding and Contract Documents for this Project, including any and all Addenda issued, and also certifies that they have visited the location of the Project work and examined all conditions at the site which will affect the work. All required qualification forms to be submitted with Bid forms.

2. LUMP SUM GRAND TOTAL

The undersigned Contractor proposes to furnish all labor, materials, equipment, services and related items necessary for, or incidental to, the proper execution and completion of the Work in strict conformance with the Bidding and Contract Documents, on or before the time of completion specified, for the Stipulated Sum for Materials plus Labor of:

____)

LUMP SUM GRAND TOTAL BID AMOUNT:

(Words)

3. <u>ADDENDUM RECEIPT</u>

The undersigned Contractor acknowledges the receipt of the following Addenda to the Bidding and Contract Documents, but he agrees that he is bound by all Addenda, whether or not listed herein:

Addendum No	Dated:	
Addendum No	Dated:	
Addendum No	Dated:	

All required qualification forms found in DOCUMENT 001153 - REQUEST FOR QUALIFICATIONS to be submitted with Bid forms.

STATEMENT OF NON-COLLUSION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of his knowledge and belief: (1) The prices in this bid have been arrived at independently without collusion, consultation, communications, or agreement, for the purpose of restricting competition as to any matter relating to such prices with any other bidder or with any competitor; (2) Unless required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any other competitor, and (3) No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

SNATURE:	
ME:	
`LE:	
TE:	
ONE:	
IAIL:	

Corporate Seal:

DOCUMENT 00708

GENERAL CONDITIONS – COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE (CCSNH)

PART

ITEM

1	DEFINITIONS
2	CONTRACT DOCUMENTS
3	NOTICE
4	ACCESS TO THE WORK
5	ACCIDENT PROTECTION
6	HAZARDOUS MATERIALS
7	SUBCONTRACTS
8	RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY
9	MUTUAL RESPONSIBILITY OF CONTRACTORS
10	PAYMENTS TO CONTRACTOR
11	CONTRACTOR'S TITLE TO MATERIALS
12	CHANGES IN WORK
13	ASSIGNMENTS
14	SUPERINTENDENCE BY CONTRACTOR
15	FAILURE TO COMPLETE WORK ON TIME
16	SUBSTANTIAL COMPLETION AND FINAL INSPECTION
17	DEFAULT AND TERMINATION OF CONTRACT
18	TERMINATION OF CONTRACT WITHOUT FAULT
19	ASSIGNMENT PROVISION

PART 1 DEFINITIONS

- A. Addendum. Written and/or graphic information issued before opening *Proposals* that modifies or interprets the *Bidding Documents* by additions, deletions, clarifications or corrections.
- B. Advertisement. A public announcement in the form of an *Invitation to Bid*, inviting *Bids* for *Work* to be performed and/or *Materials* to be furnished.
- C. Alteration Order. A written agreement between the *Contractor* and the *Community College System of New Hampshire* that amends the *Contract* and identifies *Work* that affects either the *Contract Sum, Completion Date, Credit*, or any combination thereof.
- D. Alternate. A proposed change in the *Work* described in the *Contract Documents* providing the *Community College System of New Hampshire* with an option to select between alternative materials, products or systems, or to add or delete portions of *Work*.
- E. Architect. As defined in RSA 310-A:28, a person who, by reason of having acquired through professional education and practical experience an advanced training in building construction and architectural design and an extensive knowledge of building standards created to safeguard the public from hazards such as fire, panic, structural failure, and unsanitary conditions, is technically and legally qualified to practice architecture and who is licensed by the State of New Hampshire Board of Licensure for Architects to engage in the practice of architecture. The Architect has no contractual agreement with the *Contractor* and therefore shall not directly interact with the *Contractor*.
- F. Award. The acceptance of a *Bid* prior to execution of *Contract*.
- G. **Bid.** A complete and properly signed *Proposal*, submitted in accordance with the *Bidding Requirements*, to perform the *Work* for the amount or amounts stipulated therein.
- H. **Bid Bond.** One form of a *Proposal Guaranty* executed by the *Bidder* and a *Surety* to guarantee that the *Bidder* will enter into a *Contract* within a specified time.
- I. **Bid Opening Officer.** An authorized representative of the Community College System of New Hampshire, who is responsible for opening and reading of *Bids*.
- J. **Bidder.** A *Corporation*, *Partnership*, or *Proprietorship* submitting a *Proposal*, subsequent to meeting the Community College System of New Hampshire's *Bidding Requirements*.
- K. **Bidding Documents.** Collectively, the *Invitation to Bid*, *Bidding Requirements*, *Specifications*, *Drawings*, and *Addendum*.
- L. **Bidding Requirements.** The documents that contain information regarding bidding procedures with which a *Bidder* must conform and a *Proposal* that a *Bidder* shall use to submit a *Bid*.
- M. **Builders Risk Insurance.** A specialized form of property insurance that provides coverage for loss or damage during the course of construction.

- N. **Calendar Day.** A day shown on the calendar.
- O. **Certificate of Occupancy.** A document issued by the Office of the State Fire Marshal or its authorized representative certifying that all of, or a designated portion of a building, is approved for its designated use.
- P. Certificate of Full or Partial Substantial Completion. A document prepared by the *Community College System of New Hampshire* when the *Project* reaches *Substantial Completion and only* issued after review and acceptance of the *Contractor's Request for Certificate of Full or Partial Substantial Completion.*
- Q. Chancellor. The Chancellor of the Community College System of New Hampshire.
- R. **Change Order.** A written agreement between the *Contractor* and the *Community College System of New Hampshire* that identifies *Work* to be completed as part of an Allowance Item. Any change that affects either the *Contract Sum*, Contract Time or *Credit* shall be processed as an *Change Order*.
- S. **Clerk of the Works.** An authorized representative identified by the *Community College System of New Hampshire*, responsible for observing construction on the *Community College System of New Hampshire*'s behalf for conformance with the *Contract Documents*.
- T. **College.** The college who is responsible for the facility and/or will occupy the facility after and/or during the Work. The College(s) has/have no contractual agreement with the *Contractor* and therefore shall not direct the *Contractor* in any way.
- U. **Commercial General Liability Insurance.** A broad form of liability insurance covering claims for bodily injury and property damage which combines under one policy coverage for business liability exposures, except those specifically excluded.
- V. **Completion Date.** The last day of the time allotted or the specific date established as identified in the *Contract Documents* for *Substantial Completion* of the *Work*, including any authorized extensions.
- W. **Consultant.** The *Architect*, *Engineer*, and/or professional engaged to develop/provide *Drawings, Specifications* and/or other services for the *Project*. The Consultant has no contractual agreement with the *Contractor* and therefore all interaction between any Consultant and the *Contractor* shall be done thru the *Contract Representative*.
- X. **Contract.** The written agreement between the *Community College System of New Hampshire* and the *Contractor* setting forth the obligations of the parties as outlined in the *Contract Documents*.
- Y. **Contract** *Representative*. The *Community College System of New Hampshire's* appointed representative is the CCSNH Director of Capital Planning and Development having specific authority to act on the *Community College System of New Hampshire's* behalf and shall be responsible for general supervision, control, and direction over all matters pertaining to design, construction, maintenance standards, preservation, and administration of the *Contract*. The Architect does not have such authority.

- Z. **Contract Bond.** The approved form of security to the Community College System of New Hampshire (political subdivision) in compliance with RSA 447:16 executed by the *Contractor* and their *Surety* or Sureties, guaranteeing complete execution of the contract and all supplemental agreements pertaining thereto including the payment of all legal debts pertaining to the construction of the *Project*.
- AA. **Contract Documents.** Collectively, the *Invitation To Bid*, *Bidding Requirements*, *Contract Bond*, *Specifications*, *Drawings*, *Addendum*, and other documents included in the *Contract*, and modifications, clarifications, authorized *Alteration Orders* and *Change Orders* issued after the execution of the *Contract*, to complete the *Project*. All documents shall be written in English.
- BB. **Contract Sum.** The amount stated in the *Contract*. This sum shall be derived from the *Lump Sum Base Bid*, *Lump Sum Grand Total*, or *Negotiated Price*; modified to reflect the acceptance of any *Alternates*. The *Notice to Proceed* shall state the amount that the *Community College System of New Hampshire* is obligated to pay the *Contractor*.
- CC. **Contractor.** The *Corporation*, *Partnership*, or *Proprietorship*, or any combination thereof, contracting with the Community College System of New Hampshire for performance of prescribed work.
- DD. Contractor's Request for Certificate of Full or Partial Substantial Completion. A document prepared by the *Contractor* when the *Project* reaches *Substantial Completion*.
- EE. Contractual Liability. Liability assumed by the *Contractor* under a *Contract*.
- FF. **Corporation.** A legal entity organized under the laws of a particular jurisdiction who is legally authorized to do business in the State.
- GG. **Credit.** Any Change that results in a reduction in the *Contract Sum* or *Lump Sum Grand Total* Items. All credits shall be processed by an *Alteration Order* and may include modifications to *Lump Sum Grand Total* Items.
- HH. **Day.** Unless designated as a *Working Day*, or unless otherwise indicated, this term will mean a *Calendar Day*.
- II. **Drawings (Plans).** The graphic and pictorial documents or reproductions thereof, which show the location, character, dimensions, and details of the prescribed work.
- JJ. **Final Completion.** Term denoting that the *Work* has been completed in accordance with the terms and conditions of the *Contract Documents* and all *Punch List* items have been completed.
- KK. **Final Payment.** Payment made by the *Community College System of New Hampshire* to the *Contractor*, upon *Final Completion*.
- LL. **General Conditions.** The part of the *Contract Documents* establishing the rights, responsibilities and relationships of the parties.

- MM. **Hazardous Material.** Shall include any material regulated by federal or state law and shall include but not limited to asbestos, toxic or hazardous waste, PCBs, combustible gases and materials, petroleum or radioactive material, or any other substances under any conditions and in such quantities as would pose a substantial danger to persons or property exposed to such substances.
- NN. **Indemnification.** A contractual obligation by which one person or entity agrees to reimburse others for loss or damage arising from specified liabilities.
- OO. **Invitation to Bid.** A portion of the *Bidding Documents*; the *Advertisement* for *Proposals* for *Work* or *Materials* on which *Bids* are requested. The *Advertisement* will indicate the time and place of the opening of *Proposals*, the type and location of *Work* to be performed, the character and quantity of the *Material* to be furnished and provide information on how to obtain *Drawings*, *Specifications* and *Proposal*.
- PP. Liability Insurance. A contract under which an insurance company agrees to protect a person or entity against claims arising from a real or alleged failure to fulfill an obligation or duty to a third party who is a named or an incidental beneficiary.
- QQ. Lump Sum Base Bid. One type of *Proposal* where the *Bid* is established by a single item price to perform all *Work* excluding any *Alternates* that may or may not become part of the *Contract*.
- RR. Lump Sum Grand Total. One type of *Proposal* where the *Bid* is established as a total of various items to perform all *Work* excluding any *Alternates* that may or may not become part of the *Contract*.
- SS. Low Bid. The *Bid* stating the lowest price proposed for performance of the *Work*, conforming to the *Bidding Documents*.
- TT. **Lowest Responsible Bidder.** The *Bidder* who submits the lowest bona fide *Bid* and is considered by the Community College System of New Hampshire to be fully responsible and qualified to perform the *Work* for which the *Bid* is submitted.
- UU. **Material(s).** Any substance and/or product specified for use in the construction of the *Project* and its appurtenances.
- VV. **Negotiated Price.** A *Proposal* modified by the *Lowest Responsible Bidder* thru communication with the Community College System of New Hampshire in which changes are made to the *Proposal* and/or *Completion Date* as required to meet budget, funding or scheduling requirements.
- WW. **Notice to Proceed.** A written notice to the *Contractor* to proceed with a portion of or all of the Contract Work; including the beginning of *Contract* time when applicable. The Notice to Proceed shall act as the final step in awarding the *Contract* or portion thereof.
- XX. **Occurrence Policy.** An insurance policy that covers acts or omissions occurring during the policy term, regardless of when a claim against the insured is first asserted, even if the policy is no longer in existence.

- YY. **Owner's Protective Liability Coverage.** Third-party legal liability insurance coverage protecting the *Community College System of New Hampshire* from claims arising from the construction process.
- ZZ. **Partnership.** An association of two or more persons or entities to conduct a business that shares profits and losses at a certain proportion.
- AAA. **Professional Engineer.** Referred to as Engineer. As defined in RSA 310-A:2, a person who by reason of advanced knowledge of mathematics and the physical sciences, acquired by professional education and practical experience, is technically and legally qualified to practice engineering, and who is licensed by or otherwise authorized by State of New Hampshire Professional Engineers Board to engage in the practice of engineering. The Engineer has no contractual agreement with the *Contractor* and therefore shall not directly interact with the *Contractor*.
- BBB. **Project.** The total construction of the *Work* to be performed.
- CCC. **Proposal.** A *Bidder's* offer, on *Community College System of New Hampshire* prescribed forms, to perform stated work at the quoted price(s).
- DDD. **Proposal Guaranty.** The security furnished with a *Proposal*, which shall be a *Bid Bond*, certified check or cashier's check and which provide that the *Bidder* if awarded the *Contract* will execute such *Contract* in accordance with the requirements of the *Bidding Documents*.
- EEE. **Proprietorship (Individual).** A form of business organization that is owned entirely by one person.
- FFF. **Provide.** To furnish and install a product, materials, systems, and/or equipment, complete in place, fully tested and approved.
- GGG. **Punch List.** A written document attached to the *Certificate of Substantial Completion* listing items to be completed or corrected prior to the *Community College System of New Hampshire* approval of *Final Payment*.
- HHH. **Specifications.** The volume that is part of the *Contract Documents* which contain the *General Conditions, Supplementary General Conditions, Invitation to Bid*, and individual sections that consist of written requirements for material, equipment, construction systems, standards and workmanship, and other documents or reports as applicable.
- III. **State.** The State of New Hampshire.
- JJJ. **Subcontractor.** A *Corporation*, *Partnership*, *Proprietorship*, Joint Venture or any combination thereof, to whom the *Contractor* sublets any part of the *Contract*.
- KKK. Substantial Completion. As determined by an inspection by the *Contract Representative* that the work or portion thereof is substantially complete, in accordance with the *Contract Documents*, such that the *Community College System of New Hampshire* may occupy or utilize the *Work* for its intended use without disruption or interference by the *Contractor* in completing or correcting any remaining unfinished or unacceptable *Work*.

- LLL. Substitution. A Material, product or item of equipment in place of that specified.
- MMM. **Superintendent.** The *Contractor's* authorized representative responsible for field supervision, coordination, and completion of the *Work*.
- NNN. **Supplementary General Conditions.** A part of the *Contract Documents* which supplements and may also modify, change, add to or delete from provisions of the *General Conditions*.
- OOO. **Surety.** A *Corporation*, *Partnership*, or *Proprietorship* other than the *Contractor*, executing a bond furnished by the *Contractor*.
- PPP. Umbrella Liability Insurance. Insurance providing coverage in an amount above existing liability policies.
- QQQ. Unit Price. An amount stated in a *Lump Sum Grand Total Bid* as a price per unit for an item or portion of the contract or for specific materials and/or services described in the *Contract Documents*.
- RRR. Work. The construction and services required by the *Contract Documents* to furnish all labor, materials, equipment, and incidentals necessary to complete the duties, obligations, and requirements imposed by the *Contract*.
- SSS. **Workers' Compensation Insurance.** Insurance covering the liability of an employer to employees for compensation and other benefits required by workers' compensation laws with respect to injury, sickness, disease or death arising from their employment.
- TTT. **Working Day.** Any calendar day, except Saturdays, Sundays, and Contract designated legal holidays.

PART 2 CONTRACT DOCUMENTS

- 2.1 The Contract Documents consist of the Invitation to Bid, Contract Agreement, General Conditions, Supplementary General Conditions, Drawings and Specifications, including all Addenda issued prior to execution of the Contract, wage scales where applicable, Bonds where required, insurance certificates, other documents listed in the Agreement and Modifications issued after the execution of the Contract, Change Orders and Alteration Orders issued in accordance with Part 12 of the General Conditions.
 - A. Hierarchy of the Contract Documents shall be interpreted according to the following classes:
 - 1. Community College System of New Hampshire approved modifications to the Contract Documents after execution of the Contract.
 - 2. Addenda.
 - 3. Supplemental General Conditions.
 - 4. General Conditions.
 - 5. Division 1 General Requirements.
 - 6. Remaining Specifications.
 - 7. Larger Scale Drawings & Details.
 - 8. Remaining Drawings.
- 2.2 A fully executed Contract shall not be in effect until the contract is approved and an issuance of the Notice to Proceed by the Community College System of New Hampshire.
- 2.3 This Contract is executed in a number of counterparts, each of which is an original and constitutes the entire agreement between the parties. This Contract shall be construed according to the laws of the State. No portion of this Contract shall be understood to waive the sovereign immunity of the *Community College System of New Hampshire*. This Contract shall not be amended, except as specified in Parts 13 and 20.
- 2.4 The Contract Documents are complementary and anything called for by one of the Contract Documents and not called for by the others shall be of like effect as if required by all.
- 2.5 Should the Contract Documents contain inconsistencies within a class identified in Item 2.1A, the Contractor shall provide the better quality or greater quantity of work and/or materials. The Contractor shall identify any perceived discrepancies to the Contract Representative prior to proceeding.
- 2.6 The Contractors and all Subcontractors shall refer to all of the Contract Documents, including those not specifically showing the work of their specialized trades, and shall perform all work reasonably inferable from them as being necessary to produce the intended results in compliance with applicable Federal, State, and Local codes.
- 2.7 All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the work, except where a contrary result is clearly indicated by the Contract Documents.
- 2.8 Where codes, standards, requirements, and publications of public and private bodies are referred to in the Contract Documents, such references shall be understood to be to the latest final and complete
revision at the time of receiving Bids unless specifically identified, except where otherwise indicated.

- 2.9 Where no explicit quality or standards for materials or workmanship is established for work, such work is to be consistent with the best quality workmanship standards of the applicable trade.
- 2.10 All manufactured articles, materials, and equipment shall be applied, assembled, installed, connected, erected, tested, cleaned, and conditioned in accordance with the manufacturer's written or printed directions and instructions, unless specifically indicated otherwise in the Contract Documents.
- 2.11 The Drawings are made to scale as identified therein, but all working dimensions shall be taken from the figured dimensions and by actual measurements at the job; in no case by scaling. The Contractor shall study and compare all of the Drawings and verify all figures before laying out or constructing work. The Contractor shall be responsible for errors in his/her work that might have been avoided thereby. Whether or not an error is believed to exist, deviation from the Drawings and the dimensions given thereon shall be made only after approval in writing from the Contract Representative.
- 2.12 All Drawings and Specifications and copies thereof are the property of the Community College System of New Hampshire and shall not be used by the Contractor or Subcontractor on other Projects.

PART 3 NOTICE

- 3.1 Any written notice by either party to the Contract shall be sufficiently given if delivered to or at the last known business address of the person, partnership or corporation constituting the other party to the Contract, or to his/her, their, or its duly authorized agent, representative, or officer, or when sent by registered mail to such last known business address. The last known business address shall be that location which is last provided in writing.
- 3.2 The parties shall provide their physical location/address, mailing address, telephone number, fax number, and, where available, pager number(s), email address(es), and other methods of contact for all persons associated with the Contract.

PART 4 ACCESS TO THE WORK

4.1 The Contractor shall provide for access to the work, at all times, for observation and/or inspection by the Community College System of New Hampshire, Architect, Consultant, Engineer and government officials having jurisdiction. The Contractor shall provide proper facilities for such access and inspection.

PART 5 ACCIDENT PROTECTION

5.1 It is a condition of this Contract, and shall be made a condition of each subcontract entered into pursuant to the Contract, that the Contractor, any Subcontractors, or Independent Contractors shall not require any laborer or mechanic employed in the performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to the laborer's health or safety as determined by construction safety and health standards of the Occupational Safety and Health Administration, United States Department of Labor, which standards include, by reference, the established Federal Safety and Health Regulations for Construction. These standards and regulations comprise Part 1910 and Part 1926 respectively of Title 29 of the Code of Federal Regulations, as may be revised from time to time. In the event any revisions in the Code of Federal Regulations are published, such revisions will be deemed to supersede the appropriate Part 1910 and Part 1926, and be effective as of the date set forth in the revised regulation.

PART 6 HAZARDOUS MATERIALS

- 6.1 The Contractor shall also be aware of laws and regulations relating to hazardous materials that may be encountered during construction operations, either within project limits or at material sites off the project. The health and safety of employees, the general public, and the potential of damage to the overall environment is possible if hazardous materials are not recognized, reported, and the appropriate action taken to dispose of, remove from the site, or otherwise contain the possible contaminants.
- 6.2 If any abnormal condition is encountered or exposed that indicates the presence of a hazardous material or toxic waste, construction operations shall be immediately suspended in the area and the Contract Representative notified. No further work shall be conducted in the area of the contaminated material until the site has been investigated and the Community College System of New Hampshire has given approval to continue the work in the area. The Contractor shall fully cooperate with the Community College System of New Hampshire and perform any remedial work as directed. Work shall continue in other areas of the Project unless otherwise directed.
- 6.3 Exposure to hazardous materials may result from contact with, but not necessarily limited to, such items as drums, barrels, and other containers, waste such as cars, batteries, and building construction debris. Containers leaking unknown chemicals or liquids, abandoned cars leaking petroleum products, batteries leaking acid, construction debris which may include asbestos, or any other source of suspected hazardous material found within excavation areas or stockpiled on land within construction limits shall be referred to the Department of Environmental Services and Contract Representative so that a proper identification of the materials may be made and disposal procedures initiated as required.
- 6.4 Disposition of the hazardous material or toxic waste shall be made under the requirements and regulations of the Department of Environmental Services. Work required to dispose of these materials and any remedial work shall be performed under a Supplemental Agreement or Contract item, if included in the Contract.

PART 7 SUBCONTRACTS

- 7.1 Nothing contained in the Specifications or Drawings shall be construed as creating any contractual relationship between any Subcontractor and the Community College System of New Hampshire. The Sections of the Specifications are not intended to control the Contractor in dividing the work among Subcontractors or to limit the work performed by any trade.
- 7.2 The Contractor shall be as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as he/she is for the acts and omissions of persons directly employed by him/her.
- 7.3 The Contractor shall, without additional expense to the Community College System of New Hampshire, utilize the services of specialty Subcontractors, as required to complete the work.
- 7.4 The Contract Representative will not undertake efforts to settle or resolve any differences between the Contractor and Subcontractors or between Subcontractors.
- 7.5 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the General Conditions and other Contract Documents insofar as applicable to the work of Subcontractors and to give the Contractor the same power to terminate any subcontract that the Contract Representative may exercise over the Contractor under any provisions of the Contract Documents.

PART 8 RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY

- 8.1 In case of any emergency that threatens loss or injury of property, and/or safety of life, the Contractor shall act as the situation may warrant. He/she shall notify the Contract Representative thereof immediately thereafter. Any compensation claimed by the Contractor together with substantiating documents in regard to expense, shall be submitted to the Contract Representative and the amount of compensation shall be determined by agreement.
- 8.2 In the event the Community College System of New Hampshire learns of an emergency that threatens loss or injury of property, and/or safety of life, the Community College System of New Hampshire shall notify the Contractor using the contact information provided pursuant to PART 3 herein. The Community College System of New Hampshire may, but shall have no duty to take reasonable steps to mitigate the damage or loss to the Contractor. In either event, the Community College System of New Hampshire shall have no duty to undertake any specific acts and shall have no liability for actions or inactions taken absent gross negligence.

PART 9 MUTUAL RESPONSIBILITY OF CONTRACTORS

9.1 If the Contractor or any of his/her Subcontractors or employees causes loss or damage to any separate Contractor or Subcontractor on the work, the Contractor or Subcontractor agrees to settle with such separate Contractor or Subcontractor by agreement, if he/she will so settle. If such separate Contractor or Subcontractor sues the Community College System of New Hampshire because of any loss so sustained, the Contract Representative shall notify the Contractor and/or their Subcontractors, who shall indemnify and hold harmless the Community College System of New Hampshire against any expenses or judgment arising therefrom.

PART 10 PAYMENTS TO CONTRACTOR

- 10.1 The Community College System of New Hampshire will process payments to the Contractor each month on the basis of duly certified and approved estimates of the work performed during the preceding period. In preparing estimates, the material delivered on the site and any preparatory work done may be taken into consideration. Payments will only be approved in an amount no greater than the percentage of project completion, as determined by the Contract Representative.
- 10.2 At least ten (10) days before the end of the billing period, the Contractor shall submit to the Contract Representative, an itemized Requisition for Payment, supported by such data substantiating the Contractor's right to payment as the Contract Representative may require. If payment is to be made for materials or equipment not incorporated in the work, but delivered and suitably stored at the site, or at some other location agreed upon in writing, such payment shall be conditional upon inspection and/or observation by the Community College System of New Hampshire and submission by the Contractor of bills of sale or such other procedure satisfactory to the Contract Representative to establish the Community College System of New Hampshire's title to such materials or equipment or otherwise protect the Community College System of New Hampshire's title to such materials or equipment or otherwise protect the Community College System of New Hampshire's interest including applicable insurance and transportation to the site.
- 10.3 Immediately upon receipt of the Monthly Requisition for Payment, Contractor shall post same at the Contractor's Field Office or project site in a location where Subcontractors have clear access.
- 10.4 Retainage:
 - A. Contract Payment Withheld: A 5% retainage shall be withheld from each Progress Payment until issuance of a Certificate of Substantial Completion. The balance remaining after the specified percentage has been retained, less all previous payments, will be certified for payment on each partial estimate.

***** [OR] *****

- B. Irrevocable Letter of Credit: In lieu of retainage for Projects amounting to Five Hundred Thousand (\$500,000.00) or more, the Contractor, with the approval of the Community College System of New Hampshire, may provide the Community College System of New Hampshire with a Letter of Credit in an amount equal to five percent (5%) of the total adjusted Contract amount at the time of such request. Any such Letter of Credit must be irrevocable (that is, it may be modified or revoked only with the consent of the Community College System of New Hampshire). It shall have a termination date at least one hundred twenty (120) days after the completion date specified in the underlying Contract, or as may be altered in accordance with the Contract Documents, whichever is later. The Letter of Credit shall authorize the Community College System of New Hampshire to require the issuing financial institution to deposit with the Community College System of New Hampshire an amount equal to the retainage that would have been deducted from payment to the Contractor, as specified in 10.4.A.1. The Community College System of New Hampshire may utilize the amount so deposited in the same manner as retainage.
- 10.5 Retainage will be released at Final Payment.
 - A. After the Certificate of Substantial Completion has been issued, upon written application by the Contractor and with the approval of the Surety, the Contract Representative may release a portion of the retained amount.

- 10.6 Payment for Material On Hand:
 - A. Partial payments are made for materials to be incorporated in the Work, provided the materials meet the requirements of the Contract and are delivered on, or in the vicinity of, the Project site and stored in acceptable places. Partial payments will not exceed 90 percent of the Contract unit price for the item or the amount supported by copies of paid invoices, freight bills, or other supporting documents required by the Community College System of New Hampshire. The quantity paid will not exceed the corresponding quantity estimate in the Contract. No partial payment will be made on living or perishable materials until incorporated in the Work.
 - B. When material payments exceed \$100,000 or 10 percent (10%) of the total contract amount, whichever is less, notarized copies of paid invoices or copies of canceled checks for all such materials must be submitted to the Contract Representative within 45 days of the end date of the estimate on which the material allowance was paid. Failure to provide such documentation will result in the deduction of such material allowance from future estimates until documentation is provided.
 - C. All material and work covered by partial payments made shall thereupon become the sole property of the Community College System of New Hampshire, but this provision shall not be construed as relieving the Contractor of the sole responsibility of all materials and work upon which payments have been made or the restoration of any damaged work or as a waiver of the right of the Community College System of New Hampshire to require the fulfillment of all the terms of the Contract.
- 10.7 Payment for Material Not on Hand:
 - A. Upon receipt of a written request by the Contractor, partial payment may be made for acceptable, fully-fabricated, nonperishable materials not delivered that are unique to the Project provided the materials meet the requirements of the Contract and are stored in excess of 30 days at locations approved by the Community College System of New Hampshire, and provided all required certificates of compliance, mill test reports, shop inspector's acceptance and any other required materials certification have been furnished. Materials shall be identifiable and accessible for inspection. Storage areas shall provide adequate protection so that such materials will meet the Contract requirements upon delivery to the site.
 - B. Partial payment will be based on the actual cost to the Contractor as indicated on invoices furnished to the Contract Representative. When material payments exceed \$100,000 or 10 percent of the total contract amount, whichever is less, notarized copies of paid invoices or copies of canceled checks for all such materials must be submitted to the Contract Representative within 45 days of the end date of the estimate on which the material allowance was paid. Failure to provide such documentation will result in the deduction of such material allowance from future estimates until documentation is provided. Payment shall not exceed 90 percent of the bid price. NO payment will be made on materials for any item in the contract whose total dollar value is less than \$5,000. Approval of partial payment will not constitute final acceptance of the materials for use in completing items of work.

10.8 Release of Claims:

- A. Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver a complete release of all claims arising under and by virtue of this Contract, including claims for all Subcontractors and suppliers of either materials or labor, plus a release of the Contract Bond and a statement that all Subcontractors and suppliers have been paid. The Chancellor may pay any and all such claims, in whole or in part, and deduct the amount or amounts so paid from any partial or final payment.
- 10.9 Final Payment:
 - A. Application for Final Payment received from the Contractor will be processed for payment not less than 90 days after project acceptance and final completion unless accompanied by a release of the Contract Bond. This payment shall be the amount of the Contract, amended by approved alteration orders, less previous payments minus liquidated damages, additional penalties or holdbacks. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.
- 10.10 Acceptance of Final Payment Constitutes Release:
 - A. The acceptance of the Final Payment by the Contractor shall be and shall operate as a release to the Contractor of all claims and of all liability to the Community College System of New Hampshire for all things done or furnished in connection with this work. No payment, however, final or otherwise, shall operate to release the Contractor and its Sureties from any obligations under this Contract or the Contract Bond. Acceptance of Final Payment shall not impact any warrantees provided by the Contractor with respect to this project.

PART 11 CONTRACTOR'S TITLE TO MATERIALS

11.1 No materials or supplies for the work shall be purchased by the Contractor or any Subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that good title has been obtained for all materials and supplies for which partial payment has been accepted. If any claim is made with respect to materials provided by the Contractor, Subcontractors, or Independent Contractors, the Contractor shall defend any such claim and shall pay any judgment or settlement thereon.

PART 12 CHANGES IN WORK

- 12.1 No charge for any extra work or material will be allowed without a fully executed Alteration Order. (Refer to Specification Section 01200-Price and Payment Procedures)
- 12.2 The Commissioner may at any time, by a written order, and without notice to the Sureties, make changes in the Drawings and Specifications and Completion Date of the Contract and within the general scope thereof.
- 12.3 If any part of the work as installed be at variance with the Contract requirements, the Contract Representative may allow all or any part of such work to remain in place, if found to be in the best interest of the Community College System of New Hampshire, subject to proper adjustment in the

Contract Price. Acceptance of installed work in one instance or in any instance does not constitute a waiver of Specifications, General Conditions or contract requirements.

12.4 The Contractor shall hold the Community College System of New Hampshire and its officers, agents, servants, and employees harmless from liability of any nature including cost and expenses, for or on account of any patented or unpatented invention, process, article or applicable items manufactured or used in the performance of the Contract, including its use, unless otherwise specifically stipulated in the Contract Documents.

PART 13 ASSIGNMENTS

13.1 The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due, hereunder, without the written consent of the Commissioner and of all Sureties executing any Bonds on behalf of the Contractor if in connection with said Contract.

PART 14 SUPERINTENDENCE BY CONTRACTOR

- 14.1 The Contractor shall have on the project site, at all times when work is being performed, a competent English speaking Superintendent capable of reading and thoroughly understanding the contract documents and thoroughly experienced in the type of work being performed, satisfactory to the Community College System of New Hampshire. The Contractor shall not change superintendents without permission from the Contract Representative and shall submit a request in writing with justification for such a change.
 - A. The Superintendent shall be responsible for verifying that all materials, installation, coordination, and workmanship are in conformance with the contract documents.
 - B. Unless the Contract Representative has granted prior written approval, the Superintendent shall not, himself, engage in "hands-on" construction work.
 - C. In the event the Superintendent fails or refuses to perform functions mentioned above as determined by the Contract Representative, the Contractor agrees to a stipulated penalty of \$1,200.00 per day, in addition to any liquidated damages provided hereunder.

PART 15 FAILURE TO COMPLETE WORK ON TIME

- If the Contractor fails to complete all of the work or sections of the Project, if sections are indicated, 15.1 within the time specified in the Contract or within any additional time allowed, for each working day the Liquidated Damages identified in 16.3 will be deducted from any money due the Contractor. This deduction will be made, not as a penalty, but as fixed, agreed liquidated damages for inconvenience to the Community College System of New Hampshire and for reimbursing the Community College System of New Hampshire the cost of the Administration of the Contract, including personnel, time, engineering and inspection. Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and its Surety shall be liable to the Community College System of New Hampshire for such deficiency.
- 15.2 If the Community College System of New Hampshire permits the Contractor to continue and finish the work after the time fixed for its completion, it shall in no way operate as a waiver on the part of the Community College System of New Hampshire of any of its rights under the Contract. When the final acceptance has been duly made by the Contract Representative, any liquidated damage charges shall end.

The fixed, agreed, liquidated damages shall be assessed in accordance with the following schedule:			
	Original Contract Amo	ount, Plus Any Extras,	Amount of Liquidated Damages
	Alteration Orders, and Alternates		Per Working Day
	From More Than:	To and Including:	
	\$0	\$25,000.00	\$200.00
	\$25,000.00	\$50,000.00	\$250.00
	\$50,000.00	\$100,000.00	\$400.00
	\$100,000.00	\$500,000.00	\$450.00
	\$500,000.00	\$1,000,000.00	\$800.00
	\$1,000,000.00	\$2,000,000.00	\$1,200.00
	\$2,000,000.00	\$5,000,000.00	\$1,600.00
	\$5,000,000.00	\$10,000,000.00	\$2,000.00
	\$10,000,000.00	and above	\$2,400.00

.... 15.3

PART 16 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- 16.1 The Contractor shall provide a signed Substantial Completion Application to the Contract Representative when the work is believed to be substantially complete, in accordance with specification section 01700, accompanied by a list of items, referred to as the Punch List, to be completed or corrected. The failure to include any items of such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. On the basis of an inspection by the Contract Representative who determines that the work is substantially complete, a Certificate of Substantial Completion will be issued.
 - A. The Certificate of Substantial Completion shall:
 - 1. Include any modifications to the Punch List or value as determined by the Contract Representative.
 - 2. Establish the Date of Substantial Completion.
 - a. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion unless otherwise provided in the Certificate of Substantial Completion.
 - 3. Identify the responsibilities of the Community College System of New Hampshire and the Contractor for security, maintenance, heat, utilities, and damage to the work and insurance.
 - 4. Fix the time limit within which the Contractor shall complete the items listed herein.
- 16.2 Partial Occupancy or Use: The Community College System of New Hampshire may take occupancy or use of completed or partially completed portions of the work upon written agreement between the Commissioner and the Contractor. Said partial occupancy or use shall have the approval of the insurer and Code enforcement authorities having jurisdiction. Said partial occupancy or use, (whether substantial completion has been obtained or not) provided the Contract Representative and Contractor have agreed upon written terms detailing each of the entities responsibilities in their entirety, may be exercised under these General Conditions.
 - A. A Written agreement shall stipulate the time period for completion of all Work and the commencement date for all applicable contract warranties. Said written agreement shall be preceded by a Contractor generated listing of all incomplete Work, meeting with the approval of the Contract Representative, before partial occupancy or use is taken by the Community College System of New Hampshire with prior approval of the Division.
- 16.3 If the Contractor fails to complete the items on the "punch list," by the date specified on the Substantial Completion Certificate, then in addition to the corrective measures listed in the Certificate of Substantial Completion, the Community College System of New Hampshire may use the monies still due the Contractor to have such items completed and the Contractor shall lose any claim to the monies so used. The Surety may be notified of any delay or failure to complete the work.
- 16.4 Upon written notice that the work is ready for final inspection and acceptance, the Contract Representative shall promptly make such inspection, to determine the work is acceptable under the Contract Documents and the Contract fully performed. The Contractor shall submit a request for payment, specifically identifying Final Payment. The Contractor shall provide all certificates and reports, as required, throughout the contract and shall coordinate their preparation and submission

prior to request for final payment. Failure to submit such certificates and reports shall be considered default of contract.

PART 17 DEFAULT AND TERMINATION OF CONTRACT

- 17.1 If the Contractor:
 - A. Fails to begin work under Contract within the time identified in specification section 01100.
 - B. Fails to perform the work with sufficient workers and equipment, or with sufficient materials to assume prompt completion of said work, or
 - C. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or
 - D. Discontinues the prosecution of the work, or
 - E. Fails to resume work, which has been discontinued, within a reasonable time after notice to do so, or
 - F. Becomes insolvent or has declared bankruptcy, or commits any act of bankruptcy or insolvency, or
 - G. Makes an assignment for the benefit of creditors, or
 - H. For any other causes whatsoever, fails to carry on the work in an acceptable manner.
- 17.2 The Commissioner will give notice, in writing, to the Contractor and his Surety for such delay, neglect, and default for any item identified above.
 - A. Upon receipt of Notification of Default and the Contractor or Surety does not proceed in accordance with said Notification, then the Commissioner will Terminate the Contract. Upon which, the Commissioner shall have full power and authority, without violating the Contract, to assume the prosecution of the work. The Commissioner may enter into one or more agreements for the completion of said Contract according to the terms and conditions thereof, or use such other methods as will be required for the completion of said Contract in an acceptable manner.
 - 1. All extra costs and charges incurred by the Community College System of New Hampshire as a result of such delay, neglect or default, together with the cost of completing the work under the Contract will be deducted from any monies due or which may become due said Contractor. If such expenses exceed the sum that would have been payable under the Contract, then the Contractor and the Surety shall be liable and shall pay to the Community College System of New Hampshire, the amount of such excess.

PART 18 TERMINATION OF CONTRACT WITHOUT FAULT

- 18.1 Except in cases controlled by the preceding section, the Commissioner, for any cause, including, but not limited to an order of any Federal authority or petition of the Contractor due to circumstances beyond its control may, by written notice to the Contractor and the Surety, with the concurrence of the Governor and Council, terminate the Contract or any portion thereof subject to the Condition(s) A, B, C, and D provided below.
- 18.2 Notwithstanding anything to the contrary contained in these conditions, it is understood and agreed by the parties hereto that all obligations of the Community College System of New Hampshire hereunder, including the continuance of payments, are contingent upon the availability and continued appropriation of State and/or Federal Funds, and in no event shall the Community College System of New Hampshire be liable for any payments hereunder in excess of such available or appropriated funds. In the event of a reduction, termination or failure to appropriate any or all such available funds or appropriations or a reduction of expenditures of Community College System of New Hampshire funds by the Advisory Budget Control Committee, the Commissioner may, by written notice to the Contractor and Surety, immediately terminate this Contract in whole or in part in accordance with the following conditions:
 - A. When a Contract, or portion thereof, is terminated before completion of all items of work in the Contract, payment will be made for the actual items of work completed. Payment of items of work not completed at time of termination shall be the greater of the following amounts:
 - 1. A percentage of the Contract unit price, which percentage shall be the percentage of completion of the particular item at time of termination.
 - 2. Such amount as shall be mutually agreed upon by the parties. No claim for loss of anticipated profits on items or units of work not completed will be allowed.
 - B. Reimbursement for organization of the work and mobilization, when not otherwise included in the Contract, shall be made where the volume of work completed is too small to compensate the Contractor for these expenses under the Contract; the intent being that an equitable settlement be made with the Contractor.
 - C. Acceptable materials, obtained or ordered by the Contractor for the work, and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor based upon the delivered cost of the materials at such points of delivery as may be designated by the Contract Representative. The Contractor shall do everything possible to cancel unfilled orders.
 - D. Termination of a Contract, or a portion thereof, shall not relieve the Contractor of its responsibilities for the work completed nor shall it relieve the Surety of its obligations for and concerning any claims arising out of the work performed.

PART 19 ASSIGNMENT PROVISION

19.1 The Contractor hereby agrees that it will assign to the Community College System of New Hampshire, all causes of action that it may acquire under the anti-trust laws of New Hampshire and the United States as a result of conspiracies, combinations of contracts in restraint of trade which affect the price of goods or services obtained by the Community College System of New Hampshire under this Contract, if so requested by the Community College System of New Hampshire.

END OF SECTION

SECTION 01100

SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Contract description.
- B. Work by College.
- C. College supplied products.
- D. Contractor's use of site.
- E. Work sequence.
- F. College occupancy.
- G. Specification Conventions.

1.2 CONTRACT DESCRIPTION

Description: This project consists of renovation of two Second Floor science lab rooms 203 (1,172 SF) and 224 (1,066 SF)

Scope:. The architectural work of the contract can be summarized as: architectural, mechanical and electrical. the general construction includes steel framing, doors & hollow metal frames, partition framing, painting, wood doors, hardware, ceilings, millwork and floor finishes. The Contractor shall be responsible for collection and analysis of environmental samples. The Contractor shall take one soil sample at the bottom of the tank and analyze per DES regulations. The analysis will be sent to the Contract Administrator.

- A. Before starting work, the Contractor shall submit and gain approval for the use of all items to be utilized in the work of this section.
- B. The Contractor shall obtain local, state, or federal permits and licenses that directly impact the Contractor's ability to perform the work prior to commencing removal operations
- C. The Project will include but not be limited to the Disciplines of: General Construction: Metal Framing, Mechanical, Electrical.

- D. Perform Work of Contract under stipulated lump sum grand total contract with the College in accordance with Conditions of Contract.
- E. The Contractor shall, except as otherwise specifically stated in the Contract Documents, provide and pay for all materials, labor, tools, equipment, water, heat, fuel, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.
- 1.3 WORK BY COLLEGE
 - 1. NONE

1.4 COLLEGE SUPPLIED PRODUCTS

1. NONE

1.5 CONTRACTOR'S USE OF SITE [AND PREMISES]

- A. Limit use of site and premises to allow:
 - 1. College occupancy.
 - 2. Work by Others and Work by College.
- B. Access to Site: Limited to Normal working hours.
- C. Construction Operations: Limited to areas as designated in the plans and specifications.
- D. Time Restrictions for Performing Work: Normal working hours of [7:30] am to [4:30] pm, Monday through Friday with the following restrictions:
 - 1. No access during the following observed holidays:
 - a. New Year's Day.
 - b. Martin Luther King Jr. Civil Rights Day.
 - c. Presidents' Day.
 - d. Memorial Day.
 - e. Juneteenth.
 - f. Independence Day.
 - g. Labor Day.
 - h. Veterans' Day.
 - i. Thanksgiving Day.
 - j. Day after Thanksgiving.
 - k. Christmas Day.
 - 1. Winter recess-week between Christmas and New Year's Day.
 - 2. Access for work outside of normal working hours shall be requested in writing to the Contract Representative, at least one week in advance. The Contract Representative may accept or reject the request.

E. Utility Outages and Shutdown: Shall be coordinated with the building users to minimize disruption of services, and may require work to take place outside of normal working hours with request and approval.

1.6 WORK SEQUENCE

- A. Work shall commence within 7, days after issuance of Notice to Proceed. Failure to comply shall constitute Default of Contract.
- B. Construct Work to accommodate College's occupancy requirements during construction period, coordinate construction schedule and operations with CCSNH Contract Administrator:

1.7 COLLEGE OCCUPANCY

- A. The College intends to occupy the campus during the Project. The Contractor's guarantee of work identified in Section 1700 shall not commence until the Contractor is granted a Certificate of Substantial Completion.
- B. Cooperate with College to minimize conflict, and to facilitate College's operations.
- C. Schedule the Work to accommodate College occupancy.
- D. Partial Occupancy. The College will be permitted to partially occupy the premises as phases of the project are completed. Warranties for items contained within the areas subject to partial occupancy shall commence upon the College's use of those premises identified in the Partial Occupancy. Warranties on systems extending beyond the area subject to the Partial Occupancy shall not commence until all areas utilizing those system(s) are complete and fully functional.

1.9 SPECIFICATION CONVENTIONS

E. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Allowances (intentionally omitted).
- B. Testing and inspection allowances. (intentionally omitted)
- C. Schedule of values.
- D. Requisition for payment.
- E. Change procedures.
- F. Defect assessment.
- G. Unit prices.
- H. Alternates (intentionally omitted).
- 1.2 ALLOWANCES (intentionally omitted).
- 1.3 TESTING AND INSPECTION ALLOWANCES (intentionally omitted)

1.4 SCHEDULE OF VALUES

- A. Submit printed schedule on AIA Form G703 Continuation Sheet for G702. Contractor's standard form or electronic media printout will be considered.
- B. Submit Schedule of Values in duplicate within 15 days after date of issuance of Notice to Proceed. Failure to submit within specified time period will constitute Default of Contract.
- C. Format: Utilize Table of Contents of these Specifications. Identify each line item with number and title of major specification Section. Identify bonds and insurance, allowances, and alternates
- D. Include a separate line item for the amount of each Allowance and Alternates specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- E. Revise schedule to list approved Change Orders, with each Requisitions For Payment.

1.5 REQUISITION FOR PAYMENT

- A. Submit one copy of each application.
- B. Content and Format: Items on the Requisition for Payment shall be consistent with the items on the Proposal Form. Utilize the Schedule of Values as documentation for payment items.
- C. Submit updated construction schedule with each Requisition for Payment.
- D. Payment Period: Submit at intervals stipulated in Document 00708 General Conditions. CCSNH
- E. Substantiating Data: When the Contract Representative requires substantiating information, submit data justifying dollar amounts in question.
- F. Include the following with Requisition for Payment, payment will not be processed if any items are missing or incomplete:
 - 1. Record documents as specified in Section 01700, for review by the Contract Representative, which will be returned to Contractor.
 - 2. Affidavits attesting to off-site stored products.
 - 3. Construction progress schedules, revised and current as specified in Section 01330.

1.6 CHANGE PROCEDURES

- A. Submittals: Submit name of individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. The Contract Representative will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time, or that may be necessary to carry out the work included in the Contract, by issuing supplemental instructions.
- C. The Contract Representative may issue a Proposal Request including a detailed description of proposed change(s) with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change. The Contractor will prepare and submit estimate within ten days.
- D. Contractor may propose changes by submitting a request for change(s) to the Contract Representative, describing proposed change and its full effect on the Work. Each request shall be a separate item and sequentially numbered. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors.
- E. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as approved by the Contract

Representative. Submit the breakdown of the following items on a Stipulated Sum/Price Change Order Form for review and approval by the Contract Representative:

- 1. The Contractor shall include the following indirect costs for work performed by the General Contractor as part the Contractors' price:
 - a. Worker's Compensation and Employee Liability.
 - b. Unemployment and Social Security Taxes.
- 2. In addition to the above indirect costs the General Contractor shall be allowed the following markups:
 - a. Ten percent (10%). Said ten percent (10%) shall be all inclusive for overhead, supervision, and profit for Work performed by the General Contractor
 - b. Five percent (5%) on that part of work performed by Subcontractors.
 - c. The same percentages above shall apply to Subcontractors.
- 3. On any change that involves a net credit to the State, no allowance for overhead, supervision and profit shall be figured.
- 4. Extension of Contract Time: State any requests for extension of Contract Time with justification for such a request.
- F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- G. Construction Change Directive : The Contract Representative may issue directive, signed by the Bureau Administrator or Assistant Administrator, instructing the Contractor to proceed with change in the Work, for subsequent inclusion in a Time and Material Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change. Failure to comply will result in Default of Contract.
- H. Time and Material Change Order: Submit itemized account and supporting data within 10 days of completion of change. The Contract Representative will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
 - 1. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
 - 2. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation. If acceptable, a Change Order for a Not to Exceed Amount will be prepared.
 - 3. The Contractor as payment in full, including superintendence and overhead, shall accept the compensation herein provided and profit, for extra work performed. For all such work, the Contractor shall furnish certified copies of the payrolls on forms provided for that purpose, invoices of all materials, and such other information as may be required by the Contract Representative. Submit the breakdown of items on a Bureau Time and Material Change Order Form for review and approval by the Contract Representative:
 - a. Labor (Actual wage + 40%): The Construction Superintendent is responsible for logging the time for each individual. For all laborers and

foremen engaged on the specific operation and entered directly on the Contractor's payroll, the Contractor will receive the actual rate of wage for each and every hour said laborers and Foremen are actually engaged in such work to which will be added an amount equal to forty percent (40%) of the sum thereof, which percentage shall include the cost percentages of the following items as applied to the labor cost involved:

- 1) Contract Bond Premium.
- 2) Public Liability Insurance.
- 3) Worker's Compensation Insurance.
- 4) Federal Social Security.
- 5) Unemployment Compensation Taxes
- b. Materials (Actual Cost + 10%): For all materials entering permanently into the work plus freight charges thereon, and for all labor not entered directly on his payroll, the Contractor will receive the actual cost, as shown by original receipted bills forwarded to the Contract Representative, to which cost will be added an amount equal to ten percent (10%) of the sum thereof. Bills presented by the Contractor for material taken back from his stock will be subject to the ten percent (10%) allowance if approved by the Contract Representative.
- c. Equipment (Reasonable Rental Charge + 0%): For any trucks, machinery or special equipment, other than small tools, the Contractor will receive a reasonable rental charge to which sum no percentage will be added. This rental charge shall be agreed upon in writing before the work is begun and shall include an operator and all fuel, lubricants, and the upkeep of the equipment.
- 4. In addition to the above costs the General Contractor shall be allowed the following markups:
 - a. Ten percent (10%). Said ten percent (10%) shall be all inclusive for overhead, supervision, and profit for Work performed by the General Contractor
 - b. Five percent (5%) on that part of work performed by Subcontractors.
 - c. The same percentages above shall apply to Subcontractors.
- 5. Extension of Contract Time: State any requests for extension of Contract Time with justification for such a request.
- I. Any Changes that result in a credit to any portion of the contract and/or a change in the Contract Time must be processed as an Change Order except as provided for in Item 1.2E.
- J. Execution of Change Orders: CCSNH Contract Representative will issue Change Orders per the following procedures.
 - 1. The Contract Representative reviews cost for Change in Work. If needed the Contract Representative will request additional items, back-up information, and request any possible changes or clarifications.
 - 2. Contract Representative will prepare a Change Order.
 - 3. Contract Representative will issue the Change Order to the Contractor for review and signature.
 - 4. Contractor submits signed Change Order to the Contract Representative.

- 5. The Contract Representative completes the Change Order with the signature of the College Representative
- 6. A fully signed and executed Change Order is issued to Contract Representative, Clerk of the Works, and Contractor.
- K. Execution of Change Orders: The Contractor is responsible for preparing and updating a spreadsheet log itemizing all Proposed Changes. A separate spreadsheet shall be completed for each Allowance Item. The spreadsheet shall include columns for Proposed Change Number, Description, Amount of Change, (or initial order of magnitude), Status, and Approved Amounts. In addition a current balance remaining shall be included. Change Orders will be processed per the following procedures:
 - 1. The Contract Representative reviews cost for Change in Work with the College and Consultant(s). If needed the Contract Representative will request additional items, back-up information, and request any possible changes or clarifications.
 - 2. Contract Representative and College Representative signs Change Order.
 - 3. Contractor can proceed with Change Order Work with direction from the Contract Representative.
 - 4. Fully signed and executed Change Order is issued to the Contract Representative, Clerk of the Works, and Contractor.
- L. Correlation Of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
 - 2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
 - 3. Promptly enter changes in Project Record Documents.

1.7 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Contract Representative, it is not practical to remove and replace the Work, the Contract Representative will direct appropriate remedy or adjust payment.
- C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of the Contract Representative.
- D. Defective Work will be repaired to instructions of and acceptance by the Contract Representative, and unit sum/price will be adjusted to new sum/price at discretion of the Contract Representative.
- E. Authority of the Contract Representative to assess defects and identify payment adjustments, is final.
- F. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.

- 3. Products not completely unloaded from transporting vehicle.
- 4. Products placed beyond lines and levels of required Work.
- 5. Products remaining on hand after completion of the Work.
- 6. Loading, hauling, and disposing of rejected products.

1.8 UNIT PRICES

- A. NONE
- 1.9 ALTERNATES (intentionally omitted)

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Permits and fees.
- C. Field engineering.
- D. Preconstruction meeting.
- E. Site mobilization meeting.
- F. Progress meetings.
- G. Pre-installation meetings.
- H. Cutting and patching.
- I. Notification of Subcontractors and Workmen's Compensation Insurance (SB 78)
- J. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections of the Specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. The Contractor shall comply with the "Underground Utility Damage Prevention System" by notification to DIG-SAFE SYSTEM of intent to excavate near or around any underground utility installations in public ways. The Contractor shall call 1-800/225-4977 at least seventy-two (72) hours in advance of starting any excavation. Saturday, Sundays, and legal holidays are not included in the computation of the required seventy-two (72) hour notice.
- C. Prior to any Work, the Contractor shall hire an independent company to locate utilities potentially affected by the Work and as shown and/or identified in the Contract Documents. All utilities shall be identified by the Contractor on the Record Drawings.
- D. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

- E. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion [and for portions of Work designated for State's [partial] occupancy].
- H. After State occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of State's activities.

1.3 PERMITS AND FEES

- A. The CCSNH shall obtain and pay for all permits, and impact fees as may be required by law for construction of CCSNH's facility. The Contractor shall pay for all fees and charges, and use of the property other than the site of the work for storage of materials or other purposes.
- B. The Contractor shall pay all applicable Federal, State, and Local sales and other taxes, except taxes and assessments on the real property comprising the site of the Project.
- 1.4 FIELD ENGINEERING (not used)

1.5 PRECONSTRUCTION MEETING

- A. The Contract Representative will schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance required (unless otherwise waived): Contract Representative, Clerk of the Works, Contractor, Contractor's Superintendent, and major Subcontractors.
- C. Potential Agenda Topics:
 - 1. Distribution of Contract Documents.
 - 2. Submission of list of Subcontractors, insurance carriers, subcontracting relationship, list of products, schedule of values, and progress schedule.
 - 3. Designation of personnel representing parties in Contract.
 - 4. Use of premises by CCSNH and Contractor.
 - 5. College's requirements and partial occupancy.
 - 6. Construction facilities and controls provided by CCSNH.
 - 7. Temporary utilities provided by CCSNH
 - 8. Security and housekeeping procedures.
 - 9. Schedules.
 - 10. Application for payment procedures.
 - 11. Procedures for maintaining record documents.

- 12. Requirements for start-up of equipment.
- 13. Inspection and acceptance of equipment put into service during construction period.
- D. Contract Representative shall record minutes and distribute copies within two days after meeting to participants, with one copy to each person in attendance and one to those affected by decisions made.

1.6 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at weekly intervals.
- B. Attendance required (unless otherwise waived): Contract Representative, Clerk of the Works, Contractor, Contractor's Superintendent, and major Subcontractors.
- C. Potential Agenda Topics:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems impeding planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to Work.
- D. Contract Representative shall record minutes and distribute copies within two days after meeting to participants, with one copy to each person in attendance and one to those affected by decisions made.

1.7 PRE-INSTALLATION MEETING(S)

- A. When required in individual specification sections, convene pre-installation meetings at Project site prior to commencing work of specific section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific section.
- C. Notify the Contract Representative seven days in advance of meeting date.

D. Contractor shall prepare agenda and preside at meeting:

- 1. Review conditions of installation, preparation and installation procedures.
- 2. Review coordination with related work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of CCSNH or separate contractor.
- C. Execute cutting, fitting, and patching [including excavation and fill,] to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, roof, or floor construction; completely seal voids.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with material in accordance with design and code requirements, to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to the Contract Representative for decision or remedy.

3.2 SPECIAL PROCEDURES

- A. Materials: As specified in product sections; match existing with new products [and salvaged products] for patching and extending work.
- B. Employ skilled and experienced installer to perform alteration work.
- C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- E. Remove debris and abandoned items from area and from concealed spaces.
- F. Prepare surface and remove surface finishes to permit installation of new work and finishes.
- G. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- H. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original condition.
- I. Refinish existing visible surfaces to remain in renovated rooms and spaces, to original condition for each material, with neat transition to adjacent finishes.
- J. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- K. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Contract Representative for review.
- L. Where change of plane of 1/inch or more occurs, submit recommendation for providing smooth transition to Contract Representative for review.
- M. Trim existing doors to clear new floor finish. Refinish trim to original condition.
- N. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- O. Finish surfaces as specified in individual product sections.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Subcontractor list.
- D. Proposed products list.
- E. Product data.
- F. Shop drawings.
- G. Samples.
- H. Design data.
- I. Test reports.
- J. Certificates.
- K. Manufacturer's instructions.
- L. Manufacturer's field reports.
- M. Erection drawings.
- N. Construction photographs.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with CCSNH accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Incomplete items or items submitted without the Contractor's signed stamp of approval thereon will be returned rejected.
- E. Schedule submittals to expedite Project. Coordinate submission of related items. Deliver to: Contract Representative Matthew Moore <u>memoore@ccsnh.edu</u> Director of Capital Projects & Planning Community College System of New Hampshire 26 College Drive Concord, NH 03301
- F. For each submittal for review, allow 14 days excluding delivery time to and from Contract Representative.
 - 1. All shop drawings to be returned to Contractor from the Contract Representative. Direct return of shop drawings from Architect or Engineer to Contractor is not permitted.
- G. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Architect or Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.
- L. Work shall not begin until [All] submittal items have been approved and returned to General Contractor by the Contract Representative.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedules at PreConstruction Meeting.
- B. Submit revised Progress Schedules with each Application for Payment.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

- E. Submit horizontal bar chart with separate line for each major portion of Work or operation\ and section of Work, identifying first work day of each week.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.
- G. Indicate estimated percentage of completion for each item of Work at each submission.
- H. Submit separate schedule of submittal dates for shop drawings, product data, and samples, including CCSNH furnished products and dates reviewed submittals will be required from Contract Representative. Indicate decision dates for selection of finishes. Selection of finishes cannot occur until ALL finish items are submitted and products are approved.
- I. Indicate delivery dates for furnished products.
- J. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
 - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including effect of changes on schedules of separate contractors.

1.4 SUBCONTRACTOR LIST

- A. Submit list, at the PreConstruction Meeting, of subcontractors setting forth in detail the work for which they will be responsible. In addition, the General Contractor shall identify what work will be performed with the Bidder's own forces.
- B. Provide Subcontractor and Insurance information as required under SB 78.
 - 1. Subcontractor list is to include subcontracting relationship and the carrier of Workmen Compensation Insurance for all subcontractors, all tiers.
 - 2. Proof of Insurance is to be provided within 36 hours of request.
 - 3. Changes and additional to Subcontractor and Insurance is to be provided to the CCSNH within 36 hours of occurrence.
 - 4. The CCSNH will post this information in a publicly accessible website for the duration of the contract.

1.5 PRODUCT DATA

- A. Product Data: Submit for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic copies to the Contract Representative. The copy for the CCSNH is separate from the copy the Contractor to provide as part of close out procedures.

- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01700.

1.6 SHOP DRAWINGS

- A. Shop Drawings: Submit for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Submit an electronic copy to the Contract Representative. The copy for the CCSNH is separate from the copy the Contractor to provide as part of close out procedures.
- D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01700.

1.7 SAMPLES

- A. Samples: Submit for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 - 1. Submit to Contract Representative for aesthetic, color, or finish selection.
 - 2. Submit samples of finishes from full range of manufacturers' standard colors, in custom colors selected, textures, and patterns for Contract Representative and System approval.
- C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- D. Include identification on each sample, with full Project information.
- E. Submit number of samples specified in individual specification sections; Contract Representative will retain one sample and Architect or Engineer will retain one sample.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01700.

1.8 DESIGN DATA

- A. Submit for Contract Representative's knowledge.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.9 TEST REPORTS

- A. Submit for Contract Representative's knowledge.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor, to Contract Representative in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Contract Representative.

1.11 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, [start-up,] adjusting, and finishing, to the Contract Representative in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Contract Representative's and System's benefit.
- B. Submit report in duplicate within 7 days of observation to the Contract Representative for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.13 ERECTION DRAWINGS

A. Submit to the Architect and Contract Representative for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

B. Data indicating inappropriate or unacceptable Work may be subject to action by the Architect, Engineer, or Contract Representative.

1.14 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of construction throughout progress of Work produced by an experienced] photographer, acceptable to the Contract Representative.
- B. Twice monthly submit photographs.
- C. Photographs: Submit digital images on 3-1/2" diskettes or on compact discs.
- D. Take multiple site photographs from differing directions and interior photographs indicating relative progress of the Work, three (3) days maximum prior to submitting.
- E. Identify each image. Identify name of Project, contract number phase orientation of view, date and time of view.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.
- F. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. All materials and equipment shall be new, except as specifically permitted by Contract Documents.
- C. Furnish interchangeable components from same manufacturer for components being replaced.
- D. The use of asbestos containing materials shall be prohibited.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.

- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection only with prior approval from the Contract Representative.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 **PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with or without provision for substitutions: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed. Submit request for substitution for any manufacturer not named in accordance with the following article.

1.6 PRODUCT SUBSTITUTION PROCEDURES

- A. Where Bidding Documents stipulate particular Products, substitution requests will ONLY be considered before receipt of Bids. Submit requests per the requirements specified in this section.
 - 1. All requests shall be submitted to the Contract Representative not later than five (5) business days before the hour and day set for bid opening. Incomplete requests or requests received after this deadline will not be considered.
 - 2. All requests that are approved and are acceptable to CCSNH will be issued as part of an Addendum to each Bidder who has received a set of bidding documents, so that all Bidders may avail themselves of the change in submitting their Proposals.
- B. Substitutions [may] be considered after bid opening when a product becomes unavailable through no fault of the Contractor. The Contractor shall apply to the Contract Representative, in writing, within ten (10) days of his realizing his inability to furnish the article specified, describing completely the substitution he desires to make. The Contractor shall include a dated written statement from the manufacturer outlining an explanation for the unavailability of the product. Substitutions for reasons of lead times, i.e., the time between when the Contractor orders necessary materials from the vendor
and anticipated delivery, will only be reviewed if the lead time is more than the length of the contract time. The Department may extend the contract time to accommodate the product specified. No additional costs from the Contractor will be considered due to the fact that the Contractor shall verify lead times and coordinate with contract time during the bidding phase.

- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that Bidder:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same warranty for Substitution as for specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the State.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Department and Architect and/or Engineer for review or redesign services associated with re-approval by authorities having jurisdiction.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
 - 3. The Department will notify Bidders in writing of decision to accept by issuing an addendum.

PART 2 PRODUCTS

A. Not used

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Protecting installed construction.
- D. Project record documents.
- E. Manual for materials and finishes.
- F. Product warranties and product bonds.
- G. Guarantee of work.

1.2 CLOSEOUT PROCEDURES

- A. Submit a signed Substantial Completion Application attesting that the Contract Documents have been reviewed, Work has been inspected, and that all Work is complete in accordance with Contract Documents and ready for Contract Representative review. The Substantial Completion Application for use by the Contractor is attached to the end of this specification section. The Contract Representative may modify this Agreement to accommodate any changes in Work.
 - 1. Provide submittals to the Contract Representative as required by the Contract Documents and as required by authorities having jurisdiction.
- B. Only after completion of all Punch List items and submission of all items the Contractor shall submit a Final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- C. College will occupy portions of building as specified in Section 01100.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean debris from roofs, gutters, downspouts, and drainage systems.
- C. Clean site; sweep paved areas, rake clean landscaped surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by State.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish [first] [main] floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.

- 5. Details not on original Contract drawings.
- G. Submit documents to the Contract Representative at time of Substantial Completion.

1.6 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. The Contract Representative will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by State, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes (15) fifteen days prior to Substantial Completion. Draft copy be reviewed and returned after Substantial Completion, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit one set of revised final volumes in final form prior to final inspection, and one electronic version.
- E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.
- F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- H. Additional Requirements: As specified in individual product specification sections.
- I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.7 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after Substantial Completion. All warranties start dates shall be the Substantial Completion Date, if project is phased all warranties to start at the date of Substantial Completion of each phase.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.

- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with State's permission, submit documents within (10) ten days after acceptance.
 - 2. Make other submittals within (10) ten days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within (10) ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.8 GUARANTEE OF WORK

- A. Except as otherwise specified, all work shall be guaranteed by the Contractor against defects resulting form the use of inferior materials, equipment or workmanship for one (1) year from the Date of Substantial Completion of the work.
- B. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which in the opinion of the Contract Representative, is rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract shall, promptly upon receipt of notice from the Commissioner, and at his own expense:
 - 1. Place in satisfactory condition in every particular, all such guaranteed work, correct all defects therein.
 - 2. Make good all damage to the building or site, or equipment or contents thereof, which in the opinion of the Contract Representative, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract.
 - 3. Make good any work or material, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.
- C. In any case, wherein fulfilling the requirements of the Contract or of may guarantee, embraced in or required thereby, the Contractor disturbs any work guaranteed under another contract, he shall restore such disturbed work to a condition satisfactory to the Contract Representative and guarantee such resorted work to the same extent as it was guaranteed under such other contracts.
- D. If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Commissioner may have the defects corrected and the Contractor and his/her Surety shall be liable for all expense incurred.
- E. All special guarantees applicable to definite parts of the work that may be stipulated in the Specifications or other papers forming a part of the Contract shall be subject to the term of this paragraph during the first year of the life of such special guarantee.

F. Failure to adhere to guarantee terms may result in suspension or barring from the prequalification list, or, alternatively, the requirement of a Letter of Credit or other guaranty equal to a percentage of the Contract amount.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION



Project #RVC23-01

EXHIBIT "A"

FOR

Renovation of Two Science Labs

AT

River Valley Community College

1 College Place, Claremont, NH 03743

A COMPONENT OF THE

Community College System of New Hampshire

26 College Drive, Concord, NH

PROJECT MANUAL

Attached to this exhibit:

-Specifications, Dated 3/24/23, 323 pgs

-Drawings, Dated 3/24/23, 26 pgs

PROJECT MANUAL FOR: RVCC LAB RENOVATIONS CLAREMONT, NEW HAMPSHIRE

March 24, 2023 COMMUNITY COLLEGE system of New Hampshire

ISSUED FOR CONSTRUCTION



Owner:

Matt Moore Community College System Of New Hampshire 28 College Dr, Concord, NH 03301

Architect:

Warrenstreet Architects, Inc. 27 Warren Street Concord, NH 03301 (603) 225-0640 www.warrenstreet.coop

Contact: Jonathan Smith, AIA js@warrenstreet.coop (603) 225-0640 x115

WA Project Number: 3773



PROJECT TEAM & CONTACTS

Owner:

Matt Moore, Community College System of New Hampshire 28 College Dr. Concord, NH 03301

Contact: Matt Moore, Director of Facilities, Planning, and Information Technology Phone: (603) 344 5377 Email: memoore@ccsnh.edu

Architecture:

Warrenstreet Architects, Inc. 27 Warren Street Concord, NH 03301

Contact: Jonathan Smith, Project Architect Phone: (603) 225-0640 Email: js@warrenstreet.coop

Plumbing, Mechanical

Yeaton Associates Inc. 40 S River Rd, Bedford, NH 03110

Contact: Bill Gagnon Phone: (603) 444-6578 Email: wgagnon@yeatonassociates.com

Electrical

Yeaton Associates Inc. 40 S River Rd, Bedford, NH 03110

Contact: Tom Marzec Phone: (603) 444-6578 Email: tmarzec@yeatonassociates.com









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SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section includes administrative and procedural requirements for substitutions.
 - B. Related Requirements:
 - 1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
- 1.3 DEFINITIONS
 - A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form that is part of web-based Project management software .
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as

SUBSTITUTION PROCEDURES 01 25 00 - Page 1 of 4

performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
- i. Research reports evidencing compliance with building code in effect for the Project .
- j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.
- 1.6 PROCEDURES
 - A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 90 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.



- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00



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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section includes administrative and procedural requirements for quality assurance and quality control.
 - B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

- 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.
 - d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
- 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
- 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's qualitycontrol services do not include contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARDS

- A. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- B. Obtain copies of standards where required by product specification sections.
- C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.6 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
 - 2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications

in the form of a recent report on the inspection of the testing agency by a recognized authority.

- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- 1.8 CONTRACTOR'S QUALITY-CONTROL PLAN
 - A. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent .
 - B. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.
- 1.9 REPORTS AND DOCUMENTS
 - A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.

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- 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
- 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
- 12. Name and signature of laboratory inspector.
- 13. Recommendations on retesting and reinspecting.
- 14. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. 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 installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
 - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.
 - 7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
 - 8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 10. Demolish and remove mockups when directed unless otherwise indicated.
- K. Specialty Mockups: See Section 01 43 39 "Mockups" for additional construction requirements for integrated exterior mockups .

1.11 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality-control services.
 - 3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspection will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

- 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- C. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the locations from which test samples will be taken and in which insitu tests are conducted.
 - 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform duties of Contractor.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.

- 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
- 7. Security and protection for samples and for testing and inspection equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required qualityassurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
 - 1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
 - 2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
- 1.12 SPECIAL TESTS AND INSPECTIONS
 - A. Special Tests and Inspections: Owner will engage a qualified testing agency special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Section 01 45 33 "Code-Required Special Inspections", and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
 - 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 3. Submitting a certified written report of each test, inspection, and similar qualitycontrol service to Architect with copy to Contractor and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 - 6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and authorities' having jurisdiction reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- J. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- K. Supply: Same as "Furnish".
- 1.2 INDUSTRY STANDARDS
 - A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
 - 1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. AABC Associated Air Balance Council; <u>www.aabc.com</u>.
 - 2. AAMA American Architectural Manufacturers Association; (See FGIA).
 - 3. AAPFCO Association of American Plant Food Control Officials; <u>www.aapfco.org</u>.
 - 4. AASHTO American Association of State Highway and Transportation Officials; www.transportation.org.
 - 5. AATCC American Association of Textile Chemists and Colorists; <u>www.aatcc.org</u>.
 - 6. ABMA American Bearing Manufacturers Association; www.americanbearings.org.
 - 7. ABMA American Boiler Manufacturers Association; <u>www.abma.com</u>.
 - 8. ACI American Concrete Institute; (Formerly: ACI International); www.concrete.org.
 - 9. ACPA American Concrete Pipe Association; <u>www.concrete-pipe.org</u>.
 - 10. AEIC Association of Edison Illuminating Companies, Inc. (The); <u>www.aeic.org</u>.
 - 11. AF&PA American Forest & Paper Association; www.afandpa.org.
 - 12. AGA American Gas Association; www.aga.org.
 - 13. AHAM Association of Home Appliance Manufacturers; <u>www.aham.org</u>.
 - 14. AHRI Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 - 15. AI Asphalt Institute; <u>www.asphaltinstitute.org</u>.
 - 16. AIA American Institute of Architects (The); www.aia.org.
 - 17. AISC American Institute of Steel Construction; www.aisc.org.
 - 18. AISI American Iron and Steel Institute; www.steel.org.
 - 19. AITC American Institute of Timber Construction; www.plib.org.
 - 20. AMCA Air Movement and Control Association International, Inc.; www.amca.org.
 - 21. ANSI American National Standards Institute; www.ansi.org.
 - 22. AOSA Association of Official Seed Analysts, Inc.; <u>www.aosaseed.com</u>.
 - 23. APA APA The Engineered Wood Association; www.apawood.org.
 - 24. APA Architectural Precast Association; www.archprecast.org.
 - 25. API American Petroleum Institute; www.api.org.
 - 26. ARI Air-Conditioning & Refrigeration Institute; (See AHRI).
 - 27. ARI American Refrigeration Institute; (See AHRI).
 - 28. ARMA Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.

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- 29. ASCE American Society of Civil Engineers; <u>www.asce.org</u>.
- 30. ASCE/SEI American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
- 31. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers; <u>www.ashrae.org</u>.
- 32. ASME ASME International; (American Society of Mechanical Engineers); www.asme.org.
- 33. ASSE American Society of Sanitary Engineering; www.asse-plumbing.org.
- 34. ASSP American Society of Safety Professionals (The); www.assp.org.
- 35. ASTM ASTM International; www.astm.org.
- 36. ATIS Alliance for Telecommunications Industry Solutions; <u>www.atis.org</u>.
- 37. AVIXA Audiovisual and Integrated Experience Association; (Formerly: Infocomm International); <u>www.avixa.org</u>.
- 38. AWEA American Wind Energy Association; <u>www.awea.org</u>.
- 39. AWI Architectural Woodwork Institute; <u>www.awinet.org</u>.
- 40. AWMAC Architectural Woodwork Manufacturers Association of Canada; <u>www.awmac.com</u>.
- 41. AWPA American Wood Protection Association; <u>www.awpa.com</u>.
- 42. AWS American Welding Society; <u>www.aws.org</u>.
- 43. AWWA American Water Works Association; www.awwa.org.
- 44. BHMA Builders Hardware Manufacturers Association; www.buildershardware.com.
- 45. BIA Brick Industry Association (The); <u>www.gobrick.com</u>.
- 46. BICSI BICSI, Inc.; <u>www.bicsi.org</u>.
- 47. BIFMA BIFMA International; (Business and Institutional Furniture Manufacturer's Association); <u>www.bifma.org</u>.
- 48. BISSC Baking Industry Sanitation Standards Committee; www.bissc.org.
- 49. BWF Badminton World Federation; (Formerly: International Badminton Federation); <u>www.bissc.org</u>.
- 50. CDA Copper Development Association; www.copper.org.
- 51. CE Conformite Europeenne; <u>www.ec.europa.eu/growth/single-market/ce-marking</u>.
- 52. CEA Canadian Electricity Association; www.electricity.ca.
- 53. CFFA Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
- 54. CFSEI Cold-Formed Steel Engineers Institute; www.cfsei.org.
- 55. CGA Compressed Gas Association; www.cganet.com.
- 56. CIMA Cellulose Insulation Manufacturers Association; www.cellulose.org.
- 57. CISCA Ceilings & Interior Systems Construction Association; www.cisca.org.
- 58. CISPI Cast Iron Soil Pipe Institute; <u>www.cispi.org</u>.
- 59. CLFMI Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
- 60. CPA Composite Panel Association; www.compositepanel.org.
- 61. CRI Carpet and Rug Institute (The); <u>www.carpet-rug.org</u>.
- 62. CRRC Cool Roof Rating Council; www.coolroofs.org.
- 63. CRSI Concrete Reinforcing Steel Institute; www.crsi.org.
- 64. CSA CSA Group; <u>www.csa-group.org</u>.
- 65. CSI Cast Stone Institute; www.caststone.org.
- 66. CSI Construction Specifications Institute (The); www.csiresources.org.
- 67. CSSB Cedar Shake & Shingle Bureau; <u>www.cedarbureau.org</u>.
- 68. CTA Consumer Technology Association; <u>www.cta.tech</u>.

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- 69. CTI Cooling Technology Institute; (Formerly: Cooling Tower Institute); <u>www.coolingtechnology.org</u>.
- 70. CWC Composite Wood Council; (See CPA).
- 71. DASMA Door and Access Systems Manufacturers Association; <u>www.dasma.com</u>.
- 72. DHA Decorative Hardwoods Association; (Formerly: Hardwood Plywood & Veneer Association); <u>www.decorativehardwoods.org</u>.
- 73. DHI Door and Hardware Institute; www.dhi.org.
- 74. ECA Electronic Components Association; (See ECIA).
- 75. ECAMA Electronic Components Assemblies & Materials Association; (See ECIA).
- 76. ECIA Electronic Components Industry Association; www.ecianow.org.
- 77. EIA Electronic Industries Alliance; (See TIA).
- 78. EIMA EIFS Industry Members Association; www.eima.com.
- 79. EJMA Expansion Joint Manufacturers Association, Inc.; <u>www.ejma.org</u>.
- 80. EOS/ESD Association; (Electrostatic Discharge Association); <u>www.esda.org</u>.
- 81. ESTA Entertainment Services and Technology Association; (See PLASA).
- 82. ETL Intertek (See Intertek); www.intertek.com.
- 83. EVO Efficiency Valuation Organization; <u>www.evo-world.org</u>.
- 84. FCI Fluid Controls Institute; www.fluidcontrolsinstitute.org.
- 85. FGIA Fenestration and Glazing Industry Alliance; <u>https://fgiaonline.org</u>.
- 86. FIBA Federation Internationale de Basketball; (The International Basketball Federation); <u>www.fiba.com</u>.
- 87. FIVB Federation Internationale de Volleyball; (The International Volleyball Federation); <u>www.fivb.org</u>.
- 88. FM Approvals FM Approvals LLC; www.fmapprovals.com.
- 89. FM Global FM Global; (Formerly: FMG FM Global); <u>www.fmglobal.com</u>.
- 90. FRSA Florida Roofing, Sheet Metal Contractors Association, Inc.; <u>www.floridaroof.com</u>.
- 91. FSA Fluid Sealing Association; <u>www.fluidsealing.com</u>.
- 92. FSC Forest Stewardship Council U.S.; <u>www.fscus.org</u>.
- 93. GA Gypsum Association; <u>www.gypsum.org</u>.
- 94. GANA Glass Association of North America; (See NGA).
- 95. GS Green Seal; www.greenseal.org.
- 96. HI Hydraulic Institute; www.pumps.org.
- 97. HI/GAMA Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
- 98. HMMA Hollow Metal Manufacturers Association; (See NAAMM).
- 99. HPVA Hardwood Plywood & Veneer Association; (See DHA).
- 100. IAPSC International Association of Professional Security Consultants; <u>www.iapsc.org</u>.
- 101. IAS International Accreditation Service; www.iasonline.org.
- 102. ICBO International Conference of Building Officials; (See ICC).
- 103. ICC International Code Council; <u>www.iccsafe.org</u>.
- 104. ICEA Insulated Cable Engineers Association, Inc.; <u>www.icea.net</u>.
- 105. ICPA International Cast Polymer Association; <u>www.theicpa.com</u>.
- 106. ICRI International Concrete Repair Institute, Inc.; www.icri.org.
- 107. IEC International Electrotechnical Commission; www.iec.ch.
- 108. IEEE Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
- 109. IES Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); <u>www.ies.org</u>.

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- 110. IESNA Illuminating Engineering Society of North America; (See IES).
- 111. IEST Institute of Environmental Sciences and Technology; www.iest.org.
- 112. IGMA Insulating Glass Manufacturers Alliance; (See FGIA).
- 113. IGSHPA International Ground Source Heat Pump Association; www.igshpa.org.
- 114. II Infocomm International; (See AVIXA).
- 115. ILI Indiana Limestone Institute of America, Inc.; <u>www.iliai.com</u>.
- 116. Intertek Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
- 117. ISA International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); <u>www.isa.org</u>.
- 118. ISAS Instrumentation, Systems, and Automation Society (The); (See ISA).
- 119. ISFA International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); <u>www.isfanow.org</u>.
- 120. ISO International Organization for Standardization; www.iso.org.
- 121. ISSFA International Solid Surface Fabricators Association; (See ISFA).
- 122. ITU International Telecommunication Union; www.itu.int.
- 123. KCMA Kitchen Cabinet Manufacturers Association; <u>www.kcma.org</u>.
- 124. LMA Laminating Materials Association; (See CPA).
- 125. LPI Lightning Protection Institute; www.lightning.org.
- 126. MBMA Metal Building Manufacturers Association; www.mbma.com.
- 127. MCA Metal Construction Association; <u>www.metalconstruction.org</u>.
- 128. MFMA Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
- 129. MFMA Metal Framing Manufacturers Association, Inc.; <u>www.metalframingmfg.org</u>.
- 130. MHI Material Handling Industry; www.mhi.org.
- 131. MIA Marble Institute of America; (See NSI).
- 132. MMPA Moulding & Millwork Producers Association; <u>www.wmmpa.com</u>.
- 133. MPI Master Painters Institute; www.paintinfo.com.
- 134. MSS Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; <u>www.mss-hq.org</u>.
- 135. NAAMM National Association of Architectural Metal Manufacturers; <u>www.naamm.org</u>.
- 136. NACE NACE International; (National Association of Corrosion Engineers International); <u>www.nace.org</u>.
- 137. NADCA National Air Duct Cleaners Association; <u>www.nadca.com</u>.
- 138. NAIMA North American Insulation Manufacturers Association; <u>www.nadca.com</u>.
- 139. NALP National Association of Landscape Professionals; www.landscapeprofessionals.org.
- 140. NBGQA National Building Granite Quarries Association, Inc.; www.nbgqa.com.
- 141. NBI New Buildings Institute; <u>www.newbuildings.org</u>.
- 142. NCAA National Collegiate Athletic Association (The); www.ncaa.org.
- 143. NCMA National Concrete Masonry Association; www.ncma.org.
- 144. NEBB National Environmental Balancing Bureau; www.nebb.org.
- 145. NECA National Electrical Contractors Association; www.necanet.org.
- 146. NeLMA Northeastern Lumber Manufacturers Association; www.nelma.org.
- 147. NEMA National Electrical Manufacturers Association; www.nema.org.
- 148. NETA InterNational Electrical Testing Association; www.netaworld.org.
- 149. NFHS National Federation of State High School Associations; www.nfhs.org.
- 150. NFPA National Fire Protection Association; <u>www.nfpa.org</u>.
- 151. NFPA NFPA International; (See NFPA).
- 152. NFRC National Fenestration Rating Council; www.nfrc.org.

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- 153. NGA National Glass Association (The); (Formerly: Glass Association of North America); <u>www.glass.org</u>.
- 154. NHLA National Hardwood Lumber Association; <u>www.nhla.com</u>.
- 155. NLGA National Lumber Grades Authority; <u>www.nlga.org</u>.
- 156. NOFMA National Oak Flooring Manufacturers Association; (See NWFA).
- 157. NOMMA National Ornamental & Miscellaneous Metals Association; <u>www.nomma.org</u>.
- 158. NRCA National Roofing Contractors Association; www.nrca.net.
- 159. NRMCA National Ready Mixed Concrete Association; www.nrmca.org.
- 160. NSF NSF International; <u>www.nsf.org</u>.
- 161. NSI National Stone Institute; (Formerly: Marble Institute of America); www.naturalstoneinstitute.org.
- 162. NSPE National Society of Professional Engineers; <u>www.nspe.org</u>.
- 163. NSSGA National Stone, Sand & Gravel Association; www.nssga.org.
- 164. NTMA National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
- 165. NWFA National Wood Flooring Association; <u>www.nwfa.org</u>.
- 166. NWRA National Waste & Recycling Association; www.wasterecycling.org.
- 167. PCI Precast/Prestressed Concrete Institute; <u>www.pci.org</u>.
- 168. PDI Plumbing & Drainage Institute; <u>www.pdionline.org</u>.
- 169. PLASA PLASA; (Formerly: ESTA Entertainment Services and Technology Association); <u>www.plasa.org</u>.
- 170. RCSC Research Council on Structural Connections; <u>www.boltcouncil.org</u>.
- 171. RFCI Resilient Floor Covering Institute; www.rfci.com.
- 172. RIS Redwood Inspection Service; www.redwoodinspection.com.
- 173. SAE SAE International; <u>www.sae.org</u>.
- 174. SCTE Society of Cable Telecommunications Engineers; <u>www.scte.org</u>.
- 175. SDI Steel Deck Institute; <u>www.sdi.org</u>.
- 176. SDI Steel Door Institute; www.steeldoor.org.
- 177. SEFA Scientific Equipment and Furniture Association (The); <u>www.sefalabs.com</u>.
- 178. SEI/ASCE Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
- 179. SIA Security Industry Association; www.siaonline.org.
- 180. SJI Steel Joist Institute; www.steeljoist.org.
- 181. SMA Screen Manufacturers Association; www.smainfo.org.
- 182. SMACNA Sheet Metal and Air Conditioning Contractors' National Association; <u>www.smacna.org</u>.
- 183. SMPTE Society of Motion Picture and Television Engineers; <u>www.smpte.org</u>.
- 184. SPFA Spray Polyurethane Foam Alliance; www.sprayfoam.org.
- 185. SPIB Southern Pine Inspection Bureau; <u>www.spib.org</u>.
- 186. SPRI Single Ply Roofing Industry; <u>www.spri.org</u>.
- 187. SRCC Solar Rating & Certification Corporation; www.solar-rating.org.
- 188. SSINA Specialty Steel Industry of North America; <u>www.ssina.com</u>.
- 189. SSPC SSPC: The Society for Protective Coatings; <u>www.sspc.org</u>.
- 190. STI Steel Tank Institute; <u>www.steeltank.com</u>.
- 191. SWI Steel Window Institute; <u>www.steelwindows.com</u>.
- 192. SWPA Submersible Wastewater Pump Association; <u>www.swpa.org</u>.
- 193. TCA Tilt-Up Concrete Association; <u>www.tilt-up.org</u>.
- 194. TCNA Tile Council of North America, Inc.; <u>www.tileusa.com</u>.
- 195. TEMA Tubular Exchanger Manufacturers Association, Inc.; <u>www.tema.org</u>.

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- 196. TIA Telecommunications Industry Association (The); (Formerly: TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
- 197. TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
- 198. TMS The Masonry Society; www.masonrysociety.org.
- 199. TPI Truss Plate Institute; www.tpinst.org.
- 200. TPI Turfgrass Producers International; www.turfgrasssod.org.
- 201. TRI Tile Roofing Institute; www.tileroofing.org.
- 202. UL Underwriters Laboratories Inc.; www.ul.com.
- 203. UL LLC UL LLC; www.ul.com.
- 204. UNI Uni-Bell PVC Pipe Association; www.uni-bell.org.
- 205. USAV USA Volleyball; www.usavolleyball.org.
- 206. USGBC U.S. Green Building Council; www.usgbc.org.
- 207. USITT United States Institute for Theatre Technology, Inc.; www.usitt.org.
- 208. WA Wallcoverings Association; www.wallcoverings.org.
- 209. WCLIB West Coast Lumber Inspection Bureau; www.wclib.org.
- 210. WCMA Window Covering Manufacturers Association; www.wcmanet.org.
- 211. WDMA Window & Door Manufacturers Association; www.wdma.com.
- 212. WI Woodwork Institute; www.wicnet.org.
- 213. WSRCA Western States Roofing Contractors Association; <u>www.wsrca.com</u>.
- 214. WWPA Western Wood Products Association; <u>www.wwpa.org</u>.
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
 - 1. DIN Deutsches Institut fur Normung e.V.; <u>www.din.de</u>.
 - 2. IAPMO International Association of Plumbing and Mechanical Officials; <u>www.iapmo.org</u>.
 - 3. ICC International Code Council; <u>www.iccsafe.org</u>.
 - 4. ICC-ES ICC Evaluation Service, LLC; <u>www.icc-es.org</u>.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
 - 1. COE Army Corps of Engineers; <u>www.usace.army.mil</u>.
 - 2. DOE Department of Energy; <u>www.energy.gov</u>.
 - 3. EPA Environmental Protection Agency; <u>www.epa.gov</u>.
 - 4. HUD Department of Housing and Urban Development; www.hud.gov.
 - 5. OSHA Occupational Safety & Health Administration; www.osha.gov.
 - 6. USDOJ Department of Justice; Office of Justice Programs; National Institute of Justice; <u>www.ojp.usdoj.gov</u>.
 - 7. USPS United States Postal Service; <u>www.usps.com</u>.
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of

the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

- 1. CFR Code of Federal Regulations; Available from Government Printing Office; <u>www.govinfo.gov</u>.
- 2. DOD Department of Defense; Military Specifications and Standards; Available from DLA Document Services; <u>www.quicksearch.dla.mil</u>.
- 3. DSCC Defense Supply Center Columbus; (See FS).
- 4. FED-STD Federal Standard; (See FS).
- 5. FS Federal Specification; Available from DLA Document Services; <u>www.quicksearch.dla.mil</u>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; <u>www.gsa.gov</u>.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; <u>www.wbdg.org</u>.
- 6. MILSPEC Military Specification and Standards; (See DOD).
- 7. USAB United States Access Board; <u>www.access-board.gov</u>.
- 8. USATBCB U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- E. Quality Assurance: For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
 - 1. Comply with the reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
 - 2. Maintain copy at project site during submittals, planning, and progress of the specific work, until Date of Substantial Completion.
 - 3. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
 - 4. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.
- F. Construction Industry Organization Documents:
 - 1. The American Institute of Architects (AIA):
 - a. AIA A101-1997 Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum 1997.
 - b. AIA A101 Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum 2017.
 - c. AIA A201 General Conditions of the Contract for Construction 2017.
 - d. AIA A310 Bid Bond 2010.
 - e. AIA G701 Change Order 2017.
 - f. AIA G702 Application and Certificate for Payment 1992.
 - g. AIA G703 Continuation Sheet 1992.
 - h. AIA G704 Certificate of Substantial Completion 2017.
 - 2. International Code Council, Inc. (ICC):
 - a. ICC (IBC)-2015 International Building Code 2015.
 - b. ICC (IECC)-2015 International Energy Conservation Code 2015.

REFERENCES 01 42 00 - Page 8 of 9

- c. ICC (IFC)-2015 International Fire Code 2015.
- d. ICC (IMC)-2015 International Mechanical Code 2015.
- e. ICC (IMC)-2015 International Mechanical Code 2015.
- 3. National Fire Protection Association (NFPA):
 - a. NFPA 1 Fire Code 2018.
 - b. NFPA 10 Standard for Portable Fire Extinguishers 2017, with Errata (2018).
 - c. NFPA 13 Standard for the Installation of Sprinkler Systems 2019.
 - d. NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2019.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION (Not Used)

END OF SECTION 01 42 00



MUCQIYN 01 40 00 - QUT PYRARE FACILIQIUMANS CYNQRYLM

PARQ1-9UNURAL

- 10 RULAQUS SYCGT UNQM
 - AO Sra. ingD anw general sroviDonD of tde Contract, incluwing 9 eneral anw Musslementary ConwitionD anw otder SiviDon 01 Msecification MectionD, assly to tdiD MectionO
- 102 MGT T ARE
 - AO Mection incluweDrepuirementDfor temsorary utilitieD, Dussort facilitieD, anw Decurity anw srotection facilitieDO
 - hO Relatew RepuirementD.
 - 10 Mection 01 10 00 qMummaryq for . orB reDtrictionD anw limitationD on utility interrustionDO
- 103 INFYRT AQIYNAL MGhT IQQALM
 - AO Mite Gtilikation Plan: Mdo. temsorary facilitieD, temsorary utility lineD anw connectionD, Dtaging areaD, conDtruction Dte entranceD, vedicle circulation, anw sarBing areaD for conDtruction serDonnelO
 - hO Project Iwentification anw Qemsorary MgnD Mdo. fabrication anw inDtallation wetailD, incluwing slanD, elevationD, wetailD, layoutD, tyseDtyleD, grasdic elementD, anw meDDage contentO
 - CO Fire-Mafety Program: Mdo. comsliance . itd repuirementD of NFPA 2' 1 anw autdoritieD daving juriDwictionOlnwicate Contractor serDonnel reDsonDble for management of fire-srevention srogramO
 - SO T oiDure- anw T olw-Protection Plan: SeDcribe srocewureD anw controlD for srotecting materialD anw conDtruction from . ater abDorstion anw wamage anw molwOSeDcribe welivery, danwling, Dorage, inDtallation, anw srotection sroviDonD for materialD Dubject to . ater abDorstion or . ater wamageO
 - 10 Invicate srocewureD for wiDcarwing . ater-wamagew materialD, srotocolD for mitigating . ater intruDon into comsletew WorB, anw repuirementD for reslacing . ater-wamagew WorBO
 - 20 Invicate Depuencing of . orB tdat repuireD . ater, Ducd aD Dsrayew fire-reDDtive materialD, slaDtering, anw terrakko grinwing, anw weDcribe slanD for wealing . itd . ater from tdeDe oserationDOMdo. srocewureD for verifying tdat . et conDtruction daDwriew Dufficiently to sermit inDtallation of finiDd materialDO
 - 30 Invicate metdowD to be uDew to avoiw trassing . ater in finiDdew. orBO

QUT PY RARE FACILIQIUM ANS CYNQRYLM 01 40 00 - Page 1 of 7

- UO SuDt- anw HVAC-Control Plan: Mubmit coorwination wra. ing anw narrative tdat inwicateDtde wuDt- anw HVAC-control meaDureDsrosoDew for uDe, srosoDew locationD, anw srosoDew time frame for tdeir oserationOncluwe tde follo. ing:
 - 10 HVAC DyDtem iDolation Dcdematic wra. ingO
 - 20 Location of srosoDewair-filtration DyDtem wiDcdargeO
 - 30 WaDte-danwling srocewureDO
 - 'O Ytder wuDt-control meaDureDO
- FO NoiDe anw Vibration Control Plan: Iwentify conDtruction activitieD tdat may imsact tde occusancy anw uDe of exiDting DsaceD. itdin tde builwing or awjacent exiDting builwingD, . detder occusiew by otderD, or occusiew by tde Y. nerOncluwe tde follo. ing:
 - 10 T etdowDuDew to meet tde goalDanw repuirementDof tde Y. nerO
 - 20 Invicate activitieD tdat may wiDturb nearby builwing occusantD anw tdat are slannew to be serformew wuring non-Dtanwarw. orBing dourDaDcoorwinatew. itd tde Y. nerO
 - 30 Invicate locationD of DenDtive areaD or otder areaD repuiring Dsecial attention aD iventifiew by Y. nerOnvicate meanD for comslying. itd Y. ner'D repuirementDO
- 10 PRYzUCQCYNSIQIYNM
 - AO Qemsorary GDe of Permanent FacilitieD Ungage InDtaller of eacd sermanent Dervice to aDume reDsonDbility for oseration, maintenance, anw srotection of eacd sermanent Dervice wuring itD uDe aD a conDtruction facility before Y. ner'D accestance, regarwleDD of sreviouDy aDDgnew reDsonDbilitieDO
- PARQ2 PRYSGCQM
- 20 QUT PY RARE FACILIQUM
 - AO Fielw YfficeD. Prefabricatew or mobile unitD . itd Derviceable finiDdeD, temserature controlD, anw fourwationDawepuate for normal loawingO
 - hO Common-GDe Fielw Yffice: Yf Dufficient Dke to accommowate neewD of Y. ner, Arcditect, anw conDtruction serDonnel office activitieD anw to accommowate Project meetingDDsecifiew in otder SiviDon 01 MectionDO, ees office clean anw orwerlyOFurniDd anw epuis officeDaDfollo. D
 - 10 Furniture repuirew for Project-Dite wocumentD, incluwing file cabinetD, slan tableD, slan racBD, anw booBcaDeDO
 - 20 Conference room of Dufficient Dike to accommowate meetingD of 10 inwiviwualDO Proviwe electrical so. er Dervice anw 120-V ac wuslex recestacleD, . itd no fe. er tdan one recestacle on eacd . allOFurniDd room . itd conference table, cdairD, anw' -foot- Dpuare tacB anw marBer boarwDO
 - 30 SrinBing . ater anw srivate toiletO
 - 'O Heating anw cooling epuisment neceDary to maintain a uniform inwoor temserature of / (to 72 weg FO
 - 40 Ligdting fixtureD casable of maintaining average illumination of 20 fc at weDB deigdtO

QUT PYRARE FACILIQIUM ANS CYNQRYLM 01 40 00 - Page 2 of 7

- CO Mtorage anw Fabrication MdewD Proviwe DdewD Dkew, furniDdew, anw epuissew to accommowate materialDanw epuisment for conDtruction oserationDD
 - 10 Mtore combuDtible materialDasart from builwingO
- 202 QUT PYRARE PRY ZUCQ MI9 N
 - AO Project Iwentification DgnO
 - 10 Mtructure anw Framing: Ne., . oow, Dtructurally awepuateO
 - 20 Mign MurfaceD. Uxterior grawe sly. oow . itd mewium wenDity overlay, minimum 3)' incd J 15 mm 6tdicB, Dtanwarw large DkeD to minimike jointDO
 - 30 Rougd Harw. are: 9 alvanikewO
 - 'O Paint anw PrimerD Uxterior puality, t. o coatD8 Dgn bacBgrounw of color aD DelectewO
 - 40 Lettering: Pre-cut vinyl Delf-awdeDve srowuctD, colorDaDnotewO
 - / O Provive Dgn weDgn incluwing varying Dke text anw comsany logoDaDinwicatewO
- 23 UKGIPT UNQ
 - AO Fire UxtinguiDderD Portable, GL ratew8. itd claDD anw extinguiDding agent aD repuirew by locationDanw claDDeD of fire exsoDureDO
 - hO HVAC Upuisment: GnleDDY. ner autdorikeDuDe of sermanent HVAC DyDtem, sroviwe ventew, Delf-containew, lipuiw-srosane-gaD or fuel-oil deaterD. itd inwiviwual Dsace tdermoDtatic controlO
 - 10 GDe of gaDoline-burning Dsace deaterD, osen-flame deaterD, or Dalamanwer-tyse deating unitDiDsrodibitewO
 - 20 Heating, Cooling, anw Sedumiwifying GnitD LiDtew anw labelew for tyse of fuel being conDumew, by a pualifiew teDting agency accestable to autdoritieD daving juriDwiction, anw marBew for intenwew location anw asslicationO
 - 30 Permanent HVAC MyDtem: If Y. ner autdorikeD uDe of sermanent HVAC DyDtem for temsorary uDe wuring conDtruction, sroviwe filter . itd T URV of (at eacd return-air grille in DyDtem anw remove at enw of conDtruction anw clean HVAC DyDtem aDrepuirewin Mection 01 77 00 cCloDeout ProcewureDQ

PARQ3 - UXUCGQIYN

30 QUT PY RARE FACILIQIUM, 9 UNURAL

- AO ConDervation: Coorwinate conDtruction anw uDe of temsorary facilitieD . itd conDweration given to conDervation of energy, . ater, anw materialDOCoorwinate uDe of temsorary utilitieDto minimike . aDteO
 - 10 Malvage materialD anw epuisment involvew in serformance of, but not actually incorsoratew into, tde WorBOMee otder MectionD for wiDsoDition of Dalvagew materialDtdat are weDignatewaDY. ner'DsrosertyO

302 INMQALLAQIYN, 9 UNURAL

- AO Locate facilitieD . dere tdey . ill Derve Project awepuately anw reDult in minimum interference . itd serformance of tde WorBORelocate anw mowify facilitieD aD repuirew by srogreDD of tde WorBO
 - 10 Locate facilitieD to limit Dite wiDturbance aD Dsecifiew in Mection 01 10 00 d/ummary@
- hO Proviwe eacd facility reawy for uDe . den neewew to avoiw welayOSo not remove until facilitieD are no longer neewew or are reslacew by autdorikew uDe of comsletew sermanent facilitieDO

303 QUT PYRARE GQILIQE INMQALLAQIYN

- AO 9 eneral: InDtall temsorary Dervice or connect to exiDting DerviceO
 - 10 Arrange . itd utility comsany, Y. ner, anw exiDting uDerD for time . den Dervice can be interrustew, if neceDary, to maBe connectionD for temsorary DerviceDO
- hO Water Mervice: Connect to Y. ner'DexiDting . ater Dervice facilitieDOClean anw maintain . ater Dervice facilitieD in a conwition accestable to Y. nerOAt MubDtantial Comsletion, reDtore tdeDe facilitieD to conwition exiDting before initial uDeO
- CO Manitary FacilitieD. Proviwe temsorary toiletD, a Dd facilitieD, Dafety Ddo. er anw eye. aDd facilitieD, anw wrinBing . ater for uDe of conDtruction serDonnelOComsly . itd repuirementDof autdoritieDdaving juriDwiction for tyse, number, location, oseration, anw maintenance of fixtureDanwfacilitieDO
 - 10 GDe of Permanent QoiletD GDe of Y. ner'D exiDting or ne. toilet facilitieD iD not sermittew O
- SO Ulectric Po. er Mervice: Connect to Y. ner'D exiDting electric so. er DerviceOT aintain epuisment in a convition accestable to Y. nerO
- UO Ligdting: Proviwe temsorary ligdting . itd local D itcding tdat sroviweD awepuate illumination for conDtruction oserationD, obDervationD, inDsectionD, anw traffic conwitionDO
 - 10 InDtall anw oserate temsorary lighting that fulfillD Decurity and srotection repuirementD. itdout oserating entire DyDtemO

30 MGPPYRQFACILIQIUMINMQALLAQIYN

- AO Comsly . itd tde follo. ing:
 - 10 Proviwe conDtruction for temsorary fielw officeD, DdosD, anw DdewD locatew. itdin conDtruction area or . itdin 30 feet of builwing lineD tdat iD noncombuDtible in accorwance . itd AMQT U13/ CComsly . itd NFPA 2' 10
 - 20 Gtilike weDgnatewarea . itdin exiDting builwing for temsorary fielw officeDO

QUT PYRARE FACILIQIUM ANS CYNQRYLM 01 40 00 - Page ' of 7

- 30 Taintain Dussort facilitieD until Arcditect DcdewuleD MubDtantial Comsletion inDsectionORemove before MubDtantial ComsletionOPerDonnel remaining after MubDtantial Comsletion . ill be sermittew to uDe sermanent facilitieD, unwer convitionDaccestable to Y. nerO
- hO ParBing: GDe weDignatew areaD of Y. ner'D exiDing sarBing areaD for conDiruction serDonnelO
 - 10 GDe of exiDting sarBing facilitieD by conDtruction serDonnel iD not sermittewO
 - 20 GDe of weDignatew areaD of ne. sarBing facilitieD by conDtruction serDonnel iD sermittewO
 - 3O Arrange for temsorary sarBing areaD to accommowate uDe of conDtruction serDonnelO
 - aO Locate aDassrovewby Y. ner anw ArcditectO
 - 'O T onitor sarBing of conDtruction serDonnel'D vedicleD in exiDting facilitieDOT aintain vedicular acceD to anwtdrougd sarBing areaDO
 - 40 Prevent sarBing on or awjacent to acceDroawDor in non-weDgnatew areaDO
- CO Mtorage anw Mtaging: GDe weDignatew areaD of Project Dite for Dtorage anw Dtaging neewDO
- SO Project MignD Proviwe Project DignD aD inwicatewO Gnautdorikew DignD are not sermittewO
 - 10 Iventification MgnD. Provive Project iventification DgnDaDinvicatewon Sra. ingDO
 - 20 Qemsorary MgnD Provive otder DgnD aD invicatew anw aD repuirew to inform sublic anw inviviualDbeeBing entrance to ProjectO
 - aO Proviwe temsorary, wirectional DgnDfor conDtruction serDonnel anw viDtorDO
 - 30 T aintain anw toucd us DgnD, Do tdey are legible at all timeDO
- UO WaDte SiDsoDal FacilitieD. Comsly . itd repuirementD Dsecifiew in Mection 01 7' 15 qConDtruction WaDte T anagement anw SiDsoDalQ
- 304 MUCGRIQE ANS PRYQUCQIYN FACILIQIUM INMQALLAQIYN
 - AO Protection of UxiDting FacilitieD Protect exiDting vegetation, epuisment, DtructureD, utilitieD, anw otder imsrovementD at Project Dte anw on awjacent srosertieD, excest tdoDe invicatew to be removew or alterewOResair wamage to exiDting facilitieDO
 - 10 Wdere acceDD to awjacent srosertieD iD repuirew in orwer to affect srotection of exiDting facilitieD, obtain . ritten sermiDDon from awjacent sroserty o. ner to acceDD sroserty for tdat sursoDeO
 - hO Unvironmental Protection: Proviwe srotection, oserate temsorary facilitieD, anw conwuct conDtruction aD repuirew to comsly . itd environmental regulationD anw tdat minimike soDDble air, . ater. ay, anw DubDoil contamination or sollution or otder unweDrable effectDO
 - 10 Comsly. itd. orBreDtrictionDDsecifiewin Mection 01 10 00 qMummaryQ

- CO harricaweD, Warning MgnD, anw LigdtD. Comsly. itd repuirementD of autdoritieD daving juriDwiction for erecting Dtructurally awepuate barricaweD, incluwing. arning DgnD anw ligdtingO
- SO Qemsorary Fire Protection: InDtall anw maintain temsorary fire-srotection facilitieD of tyseD neewew to srotect againDt reaDonably srewictable anw controllable fire IoDDeDO Comsly. itd NFPA 2' 18manage fire-srevention srogramO
 - 10 Prodibit DmoBing in conDtruction areaDOComsly. itd awvitional limitD on DmoBing Dsecifiew in otder MectionDO
 - 20 MuserviDe . elwing oserationD, combuDtion-tyse temsorary deating unitD, anw Dmilar DourceD of fire ignition in accorwance . itd repuirementD of autdoritieD daving juriDwictionO
 - 30 Sevelos anw DuserviDe an overall fire-srevention anw -srotection srogram for serDonnel at Project DteORevie. neewD. itd local fire wesartment anw eDtabliDd srocewureD to be follo. ewOInDtruct serDonnel in metdowD anw srocewureDOPoDt . arningDanwinformationO
 - 'O Proviwe temsorary DtanwsiseD anw doDeD for fire srotectionOHang doDeD. itd a . arning Dgn, Dtating tdat doDeD are for fire-srotection sursoDeD only anw are not to be removewOT atcd doDe Dke. itd outlet Dke anw epuis. itd Duitable nokkleDO
- 30 TYIMQGRUANS TYLS CYNQRYL
 - AO ToiDture anw Tolw Protection: Protect Dtorew materialD anw inDtallew WorB in accorwance . itd ToiDture anw Tolw Protection PlanO
- 307 Y PURAQIY N, QURT INAQIY N, ANS RUT Y VAL
 - AO MuserviDon: Unforce Dtrict wiDcisline in uDe of temsorary facilitieDOQo minimike . aDte anwabuDe, limit availability of temsorary facilitieDto eDDential anw intenwew uDeDO
 - hO T aintenance: T aintain facilitieDin goow oserating convition until removalO
 - 10 T aintain oseration of temsorary encloDureD, deating, cooling, dumiwity control, ventilation, anw Dmilar facilitieD on a 2' -dour baDD. dere repuirew to acdieve inwicatew reDultDanw to avoiw soDD bility of wamageO
 - CO Qemsorary Facility Cdangeover: So not cdange over from uDing temsorary Decurity anw srotection facilitieD to sermanent facilitieD until MubDantial ComsletionO
 - SO Qermination anw Removal: Remove eacd temsorary facility . den neew for itD Dervice daD enwew, . den it daD been reslacew by autdorikew uDe of a sermanent facility, or no later tdan MubDtantial ComsletionO Comslete or, if neceDDary, reDtore sermanent conDtruction tdat may dave been welayew becauDe of interference . itd temsorary facilityOResair wamagew WorB, clean exsoDew DurfaceD, anw reslace conDtruction tdat cannot be DatiDfactorily resairewO
 - 10 TaterialD anw facilitieD tdat conDitute temsorary facilitieD are sroserty of ContractorOY. ner reDerveD rigdt to taBe soDDeDDon of Project iwentification DgnDO

- 20 Remove temsorary roawD anw savew areaD not intenwew for or accestable for integration into sermanent conDtructionOWdere area iD intenwew for lanwDcase wevelosment, remove Doil anwaggregate fill tdat wo not comsly. itd repuirementD for fill or DubDoilORemove materialD contaminatew. itd roaw oil, aDsdalt anw otder setrocdemical comsounwD, anw otder DubDtanceD tdat migdt imsair gro. td of slant materialD or la. nDOResair or reslace Dtreet saving, curbD, anw Dwe. alBD at temsorary entranceD, aD repuirew by autdoritieD daving juriDwictionO
- 30 At MubDantial Comsletion, resair, renovate, anw clean sermanent facilitieD uDew wuring conDtruction seriowOComsly. itd final cleaning repuirementD Decifiew in Mection 01 77 00 ccloDeout ProcewureDQ

3Q QUT PY RARE PRY ZUCQ MI9 NA9 U

- AO Project iwentification Dgn:
 - 10 Yne J16 sroject iwentification Dgn of conDtruction, weDgn, anw content Ddo. n attacdew follo. ing tdiDDectionO
 - aO InDtall sroject iwentification Dgn . itdin 30 wayD after wate fixew by Notice to ProceewO
 - bO InDtall Dgn Durface slumb anw level, . itd butt jointDOAncdor DecurelyO
 - cO T aintain DgnDanw DussortD clean, resair weterioration anw wamageO
 - wO Remove DgnD, framing, DussortD, anw fourwationDat comsletion of Project anw reDtore tde areaO

UNS YF MUCQIYN 01 40 00

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gQCYIEN 0M73 00 SQUQCTYIEN

PARY MSf QNQRAL

M9M gTOOARG

- A9 gection inclu. eD 1eneral a. miniDtrative an. wroce. ural resuirementD 1overnin1 edecution o4tpe Worh, inclu. in1, but not limite. to, tpe 4bllog in1:
 - M9 ConDtruction layout9
 - 29 InDtallation o4tpe Worh9
 - 39 Cuttin1 an. watcpin19
 - B9 Coor. ination o4Eq nerSnDtalle. wro. uctD9
 - k9 Pro1reDcleanin19
 - '9 gtartin1 an. a. juDtin19
 - 79 Protection o4inDtalle. conDtruction9
 - x9 Correction o4tpe Worh9
- "9 Relate. ResuirementD.
 - M9 gection 0MM0 00 zgummaryz 4br coor. ination o4EqnerSturniDpe. wro. uctD, an. limitDon uDe o4Project Dte9
 - 29 gection 0M33 00 zgubmittal Proce. ureDz 4br Dubmittin1 DurveyD9
 - 39 gection 0M77 00 zCloDeout Proce. ureDz 4or Dubmittin1 4nal wrowerty Durvey qitp Project Recor. ; ocumentD, recor. in1 o4 EqnerSaccewte. . eviationD 4om in. icate. lineDan. levelD, rewlacin1 . e4ective q orh, an. 4nal cleanin19
 - B9 gection 07 xB MB zPenetration FireDtowwin1z 4or watcpin1 wenetrationD in 4reS rate. conDtruction9
- M92 ; QFINIYIENg
 - A9 Cuttin1: Removal o4 inSwace conDtruction neceDDary to wermit inDtallation or wer4prmance o4DubDesuent q orh9
 - "9 Patcpin1: Fittin1 an. rewair q orh resuire. to reDore conDtruction to ori1inal con. itionD a4er inDtallation o4DubDesuent q orh9
- MB PRQINg YALLAYIEN OQQYINf g
 - A9 Cuttin1 an. Patcpin1 Con4erence: Con. uct con4erence at Project Dte 9
 - M9 Prior to commencin1 q orh resuirin1 cuttin1 an. watcpin1, revieq edtent o4cuttin1 an. watcpin1 anticiwate. an. edamine wroce. ureD4br enDurin1 DatiD4actory reDult 4 om cuttin1 an. watcpin1 q orh9 In4brm Arcpitect o4 Dcpe. ule. meetin19 Resuire rewreDentativeD o4 eacp entity . irectly concerne. q itp cuttin1 an. watcpin1 to atten., inclu. in1 tpe 4blloq in1:
 - a9 Contractor/DDuwerinten. ent9
 - b9 Yra. e DuwerviDor reDvonDble 4or cuttin1 overationD9
 - c9 Yra. e DuwerviDor(D) reDwonDble 4br watcpin1 o4eacp tywe o4DubDtrate9

- .9 Oecpanical, electrical, an. utilitieD DubcontractorD' DuwerviDorD, to tpe edtent eacp tra. e iDa44ecte. by cuttin1 an. watcpin1 owerationD9
- 29 Revieq areaD o4 wotential inter4erence an. con4ict9 Coor. inate wroce. ureD an. reDolve wotential con4ictDbe4ore wrocee. in19
- "9 Layout Con4erence: Con. uct con4erence at Project Dite 9
 - M9 Prior to eDtabliDpin1 layout o4neq werimeter an. Dtructural column 1ri. (D), revieq buil. in1 location resuirementD9Revieq bencpmarh, control woint, an. layout an. . imenDon resuirementD9 In4prm Arcpitect o4 Dcpe. ule. meetin19 Resuire rewreDentativeD o4 eacp entity . irectly concerne. q itp Project layout to atten. , inclu. in1 tpe 4bloq in1:
 - a9 Contractor/DDuwerinten. ent9
 - b9 Contractor/D werDonnel reDwonDble 4or wer4ormin1 Project Durveyin1 an. layout9
 - 29 Revieq meanin1D an. intent o4. imenDionD, noteD, termD, 1rawpic DymbolD, an. otper layout in4prmation in. icate. on tpe ; raq in1D9
 - 39 Revieq resuirementD 4br inclu. in1 layoutD on gpow ; raq in1D an. otper DubmittalD9
 - B9 Revieq areaD o4 wotential inter4erence an. con4ict9 Coor. inate wroce. ureD an. reDolve wotential con4ictDbe4ore wrocee. in19
- M9B J TALIYG Agg TRANCQ
 - A9 Cuttin1 an. Patcpin1: Comwly qitp resuirementD 4br an. limitationD on cuttin1 an. watcpin1 o4conDtruction elementD9
 - M9 gtructural QlementD Wpen cuttin1 an. watcpin1 Dtructural elementD, or qpen encounterin1 tpe nee. 4or cuttin1 an. watcpin1 o4 elementD qpoDe Dtructural 4unction iDnot hnoq n, noti4y Arcpitect o4locationDan. etailDo4cuttin1 an. aqait . irectionD4om Arcpitect be4ore wrocee. in19gpore, brace, an. Duwort Dtructural elementD. urin1 cuttin1 an. watcpin19; o not cut an. watcp Dtructural elementDin a manner tpat coul. cpan1e tpeir loa. Scarryin1 cawacity or increaDe . e4ection9
 - 29 Everational QlementD; o not cut an. watcp overatin1 elementD an. relate. comwonentD in a manner tpat reDultD in re. ucin1 tpeir cawacity to wer4brm aD inten. e. or tpat reDultD in increaDe. maintenance or . ecreaDe. overational li4e or Da4ety9 Everational elementD inclu. e tpe 4blloq in1:
 - a9 Primary overational DyDtemDan. esuiwment9
 - b9 Fire Dewaration aDDemblieD9
 - c9 Air or Dmohe barrierD9
 - . 9 FireSDuwwreDDion DyDtemD9
 - e9 Plumbin1 wwin1 DyDtemD9
 - 49 Oecpanical DyDemDwiwin1 an. . uctD9
 - 19 Control DyDtemD9
 - p9 Communication DyDtemD9
 - i9 FireS etection an. Salarm DyDtemD9
 - j9 Conveyin1 DyDtemD9
 - h9 Qlectrical q irin1 DyDtemD9
 - I9 Everatin1 DyDtemDo4Dvecial conDtruction9
 - 39 Etper ConDtruction QlementD; o not cut an. watcp otper conDtruction elementD or comwonentD in a manner tpat coul. cpan1e tpeir loa. Scarryin1 cawacity, tpat

QUQCT YIE N 0M73 00 SPa1e 2 o4reDultD in re. ucin1 tpeir cawacity to wer4brm aD inten. e., or tpat reDultD in increaDe. maintenance or .ecreaDe. owerational li4e or Da4ety9 Etper conDtruction elementD inclu. e but are not limite. to tpe 4blog in1:

- a9 Water, moiDture, or vawor barrierD9
- b9 OembraneDan. 4aDpin1D9
- c9 Qdterior curtainSq all conDtruction9
- . 9 gwraye. 4reSeDDtive material9
- e9 Qsuiwment DuwwortD9
- 49 Piwin1, . uctq orh, veDDelD, an. esuiwment9
- 19 NoiDeSan. vibration&ontrol elementDan. DyDtemD9
- B9 ViDual QlementD; o not cut an. watcp conDtruction in a manner tpat reDultD in viDual evi. ence o4 cuttin1 an. watcpin19; o not cut an. watcp edwoDe. conDtruction in a manner tpat q oul., in Arcpitect/D owinion, re. uce tpe buil. in1/D aeDtpetic sualitieD9 Remove an. rewlace conDtruction tpat paD been cut an. watcpe. in a viDually unDatiD4actory manner9
- "9 Oanu4acturer/D InDtallation InDtructionD Ebtain an. maintain onSDte manu4acturer/D qritten recommen. ationD an. inDtructionD 4or inDtallation o4 Dweci4e. wro. uctD an. esuiwment9
- PARY 2 SPRE; TCYg
- 29M OAYQRIALg
 - A9 Comwly q itp resuirementD Dveci4e. in otper gection D9
 - M9 For wrojectD resuirin1 comwliance q itp DuDtainable . eD1n an. conDtruction wracticeDan. wroce. ureD, uDe wro. uctD4br watcpin1 tpat comwly q itp DuDtainable . eD1n resuirementD9
 - "9 InSPlace OaterialD. TDe materialD 4br watcpin1 i. entical to inSwace materialD9 For edwoDe. Dur4aceD, uDe materialD tpat viDually matcp inSwace a. jacent Dur4aceD to tpe 4ulleDt edtent woDDble9
 - M9 I4i. entical materialD are unavailable or cannot be uDe., uDe materialD tpat, q pen inDtalle., q ill wrovi. e a matcp accewtable to Arcpitect 4br tpe viDual an. 4unctional wer4brmance o4 inSwace materialD9 TDe materialD tpat are not conD. ere. pa5ar. ouD9
 - C9 Cleanin1 A1entD TDe cleanin1 materialDan. a1entDrecommen. e. by manu4acturer or 4abricator o4tpe Dur4ace to be cleane. 9; o not uDe cleanin1 a1entDtpat are wotentially pa5ar. ouDto pealtp or wrowerty or tpat mi1pt . ama1e 4niDpe. Dur4aceD9
 - M9 T De cleanin1 wro. uctD tpat comwly q itp f reen geal/D f g \$37, or i4f g \$37 iD not awwlicable, uDe wro. uctD tpat comwly q itp tpe Cali4ornia Co. e o4 Re1ulationD madimum alloq able VE C levelD9

QUQCT YIE N 0M73 00 SPa1e 3 o4-

PARY 3 SQUQCT YIE N

39M QUAOINAYIEN

- A9 QdiDtin1 Con. itionD Ype ediDtence an. location o4un. er1roun. an. otper utilitieD an. conDtruction in. icate. aD ediDtin1 are not 1uarantee. 9 " e4bre be1innin1 Dteq orh, inveDti1ate an. veri4y tpe ediDtence an. location o4un. er1roun. utilitieD, mecpanical an. electrical DyDtemD, an. otper conDtruction a4tectin1 tpe Worh9
 - M9 "e4bre conDtruction, veri4y tpe location an. invert elevation at wointD o4 connection o4Danitary Deq er, Dtorm Deq er, 1aD Dervice wiwin1, an. q aterSDervice wiwin16un. er1roun. electrical DerviceD6an. otper utilitieD9
 - 29 FurniDp location . ata 4br q orh relate. to Project tpat muDt be wer4brme. by wublic utilitieDDervin1 Project Dte9
- "9 Qdamination an. Accewtance o4 Con. itionD. "e4bre wrocee. in1 q itp eacp comwonent o4 tpe Worh, edamine DubDtrateD, areaD, an. con. itionD, q itp InDtaller or Awwlicator wreDent q pere in. icate., 4br comwliance q itp resuirementD 4br inDtallation toleranceD an. otper con. itionDa4tectin1 wer4brmance9Recor. obDervationD9
 - M9 Qdamine rou1pin1Sn 4br mecpanical an. electrical DyDtemD to veri4y actual locationDo4connectionDbe4bre esuiwment an. 4dture inDtallation9
 - 29 Qdamine q allD, 4oorD, an. roo4D 4or Duitable con. itionD q pere wro. uctD an. DyDtemDare to be inDtalle. 9
 - 39 Veri4y comwatibility q itp an. Duitability o4 DubDtrateD, inclu. in1 comwatibility q itp ediDtin1 4niDpeDor wrimerD9
- C9 Procee. qitp inDtallation only a4ter unDatiD4actory con. itionD pave been correcte. 9 Procee. in1 qitp tpe Worh in. icateDaccewtance o4Dur4aceDan. con. itionD9

392 PRQPARAYIEN

- A9 QdiDtin1 T tility In4prmation: FurniDp in4prmation to local utility tpat iD neceDDary to a. juDt, move, or relocate ediDtin1 utility DtructureD, utility woleD, lineD, DerviceD, or otper utility awwurtenanceDlocate. in or a4tecte. by conDtruction9Coor. inate q itp autporitieD pavin1 juriD. iction9
- "9 Fiel. OeaDurementD Yahe 4el. meaDurementD aD resuire. to 4t tpe Worh wrowerly9 Recpech meaDurementDbe4bre inDtallin1 eacp wro. uct9Wpere wortionDo4tpe Worh are in. icate. to 4t to otper conDtruction, veri4y . imenDonD o4 otper conDtruction by 4el. meaDurementD be4bre 4abrication9 Coor. inate 4abrication Dcpe. ule q itp conDtruction wro1reDto avoi. . elayin1 tpe Worh9
- C9 gwace ResuirementD. Veri4y Dwace resuirementD an. . imenDonD o4 itemD Dpoq n . ia1rammatically on ; raq in1D9
- ; 9 Revieq o4Contract ; ocumentDan. Fiel. Con. itionD Imme. iately on . iDcovery o4tpe nee. 4br clari4cation o4tpe Contract ; ocumentD, Dubmit a resueDt 4br in4brmation to Arcpitect in accor. ance q itp resuirementD in gection 0M 3M 00 zProject Oana1ement an. Coor. ination9z

398 CENgYRTCYIEN LAGETY

- A9 Veri4cation: "e4bre wrocee. in1 to lay out tpe Worh, veri4y layout in4brmation Dpoq n on ; raq in1D, in relation to tpe wrowerty Durvey an. ediDtin1 bencpmarhD an. ediDtin1 con. itionD914. iDcrewancieDare . iDcovere. , noti4y Arcpitect wromwtly9
- 39B INg YALLAYIEN
 - A9 Locate tpe Worh an. comwonentD o4 tpe Worh accurately, in correct ali1nment an. elevation, aDin. icate. 9
 - M9 Oahe vertical q orh wumb, an. mahe pori5ontal q orh level9
 - 29 Wpere Dwace iD limite., inDtall comwonentD to madimi5e Dwace available 4or maintenance an. eaDe o4removal 4or rewlacement9
 - 39 Conceal wiweD, . uctD, an. q irin1 in 4niDpe. areaDunleDDotperq iDe in. icate. 9
 - B9 Oaintain minimum pea. room clearance o4in occuwie. DwaceDan. in unoccuwie. DwaceD, aDin. icate. on tpe ; raq in1D9
 - "9 Comwly qitp manu4acturer/D qritten inDtructionD an. recommen. ationD 4or inDtallin1 wro. uctDin awwlicationDin. icate. 9
 - C9 InDtall wro. uctD at tpe time an. un. er con. itionD tpat q ill enDure DatiD4actory reDultD aD ju. 1e. by Arcpitect9 Oaintain con. itionD resuire. 4br wro. uct wer4brmance until gubDtantial Comwletion9
 - ; 9 Con. uct conDtruction owerationD, Do no wart o4 tpe Worh iD Dubjecte. to . ama1in1 owerationDor loa. in1 in edceDDo4tpat edwecte. . urin1 normal con. itionDo4occuwancy o4tywe edwecte. 4or Project9
 - Q9 gesuence the Worh an. alloq a esuate clearanceD to accommo. ate movement o4 conDtruction itemDonSD te an. wacement in wermanent locationD9
 - F9 YoolDan. Qsuiwment: gelect toolDor esuiwment tpat minimi5e wro. uction o4edceDDve noiDe levelD9
 - f 9 YemwlateD Ebtain an. . iDtribute to tpe wartieDinvolve. temwlateD4br Worh Dweci4e. to be 4actory wreware. an. 4el. inDtalle. 9Cpech gpow; raq in1D o4 otper wortionD o4 tpe Worh to con4rm tpat a. esuate wroviDonDare ma. e 4br locatin1 an. inDtallin1 wro. uctD to comwly q itp in. icate. resuirementD9
 - H9 Attacpment: Provi. e blochin1 an. attacpment wlateD an. ancporD an. 4aDtenerD o4 a. esuate D5e an. number to Decurely ancpor eacp comwonent in wlace, accurately locate. an. ali1ne. qitp otper wortionD o4 tpe Worh9 Wpere D5e an. tywe o4 attacpmentD are not in. icate., veri4y D5e an. tywe resuire. 4br loa. con. itionD qitp manu4acturer9
 - M9 Oountin1 Hei1ptD Wpere mountin1 pei1ptDare not in. icate. , mount comwonentD at pei1ptD. irecte. by Arcpitect9
 - Alloq 4or buil. in1 movement, inclu. in1 tpermal edwanDon an. contraction9
 - 39 Coor. inate inDtallation o4 ancpora1eD9 FurniDp Dettin1 . raq in1D, temwlateD, an. . irectionD 4br inDtallin1 ancpora1eD, inclu. in1 DeeveD, concrete inDertD, ancpor

boltD, an. itemD q itp inte1ral ancporD, tpat are to be embe..e. in concrete or maDonry9; eliver Ducp itemD to Project D te in time 4br inDtallation9

- 19 8ointD. Oahe jointD o4 uni4brm q i. tp9 Wpere joint locationD in edwoDe. Worh are not in. icate., arran1e jointD4br tpe beDt viDual e4ect, aD ju. 1e. by Arcpitect9Fit edwoDe. connectionDto1etper to 4brm pairline jointD9
- 39k CTYYINF AN; PAYCHINF
 - A9 f eneral: Qmwloy Dhille. q orherD to wer4brm cuttin1 an. watcpin19Procee. q itp cuttin1 an. watcpin1 at tpe earlieDt 4eaDble time, an. comwlete q itpout . elay9
 - M9 Cut inSwlace conDtruction to wrovi. e 4br inDtallation o4 otper comwonentD or wer4brmance o4otper conDtruction, an. DubDesuently watcp aD resuire. to reDtore Dur4aceD to tpeir ori1inal con. ition9
 - "9 QdiDtin1 WarrantieD. Remove, rewlace, watcp, an. rewair materialD an. Dur4aceD cut or . ama1e. . urin1 inDtallation or cuttin1 an. watcpin1 owerationD, by metpo. D an. qitp materialDDo aDnot to voi. ediDtin1 q arrantieD9
 - C9 Yemworary guwwort: Provi. e temworary Duwwort o4Worh to be cut9
 - ; 9 Protection: Protect inSwlace conDtruction . urin1 cuttin1 an. watcpin1 to wrevent . ama1e9 Provi. e wrotection 4 om a. verDe q eatper con. itionD 4 or wortionD o4 Project tpat mi1pt be edwoDe. . urin1 cuttin1 an. watcpin1 owerationD9
 - Q9 QdiDtin1 T tility gerviceD an. Oecpanical KQlectrical gyDtemD Wpere ediDtin1 DerviceD KDyDtemD are resuire. to be remove., relocate., or aban. one., bywaDD Ducp DerviceD KDyDtemD be4bre cuttin1 to minimi5e interruwtion to occuwie. areaD9
 - F9 Cuttin1: Cut inSwace conDiruction by Daq in1, . rillin1, breahin1, cpiwwin1, 1rin. in1, an. Dimilar owerationD, inclu. in1 edcavation, uDn1 metpo. D leaDt lihely to . ama1e elementD retaine. or a. joinin1 conDiruction914 woDDble, revieq wrowoDe. wroce. ureD q itp ori1inal InDtaller6comwly q itp ori1inal InDtaller/Dq ritten recommen. ationD9
 - M9 In 1eneral, uDe pan. or Dmall woq er toolD. eD1ne. 4or Daq in1 an. 1rin. in1, not pammerin1 an. cpowwin19Cut poleDan. DotD neatly to minimum D5e resuire., an. q itp minimum . iDurbance o4a. jacent Dur4aceD9Yemworarily cover owenin1D q pen not in uDe9
 - 29 FiniDpe. gur4aceD. Cut or . rill 4rom tpe edwoDe. or 4niDpe. D. e into conceale. Dur4aceD9
 - 39 Concrete an. OaDonry: Cut uDn1 a cuttin1 macpine, Ducp aDan abraDve Daq or a . iamon. Score . rill9
 - B9 Qdcavatin1 an. "ach4llin1: Comwly qitp resuirementD in awwlicable gectionD qpere resuire. by cuttin1 an. watcpin1 owerationD9
 - k9 Oecpanical an. Qectrical gerviceD Cut o44wiwe or con. uit in q allDor wartitionDto be remove. 9Caw, valve, or wu1 an. Deal remainin1 wortion o4wiwe or con. uit to wrevent entrance o4moiDture or otper 4brei1n matter a4ter cuttin19
 - '9 Procee. qitp watcpin1 a4er conDtruction owerationD resuirin1 cuttin1 are comwlete9

- f 9 Patcpin1: Patcp conDtruction by 4llin1, rewairin1, re4niDpin1, cloDn1 uw, an. Dmilar owerationD4blloq in1 wer4brmance o4otper Worh9Patcp q itp . urable DeamDtpat are aD inviDble aD wracticable, aD ju. 1e. by Arcpitect9 Provi. e materialD an. comwly q itp inDtallation resuirementDDweci4e. in otper g ectionD, q pere awwlicable9
 - M9 InDvection: Wpere 4eaDble, teDt an. inDvect watcpe. areaD a4er comwletion to . emonDtrate wpyDcal inte1rity o4inDtallation9
 - 29 QdwoDe. FiniDpeD ReDtore edwoDe. 4niDpeD o4watcpe. areaD an. edten. 4niDp reDtoration into retaine. a. joinin1 conDtruction in a manner tpat qill eliminate evi. ence o4watcpin1 an. re4niDpin19
 - a9 Clean wiwin1, con. uit, an. Dimilar 4eatureD be4bre awwlyin1 waint or otper 4niDpin1 materialD9
 - b9 ReDtore . ama1e. www.coverin1 to itDori1inal con. ition9
 - 39 FloorDan. WallD Wpere q allDor wartitionDtpat are remove. edten. one 4niDpe. area into anotper, watcp an. rewair 4oor an. q all Dur4aceD in tpe neq Dwace9 Provi. e an even Dur4ace o4 uni4orm 4niDp, color, tedture, an. awwearance9 Remove inSwace 4oor an. q all coverin1D an. rewlace q itp neq materialD, i4 neceDDary, to acpieve uni4orm color an. awwearance9
 - a9 Wpere watcpin1 occurD in a wainte. Dur4ace, wreware DubDtrate an. awwly wrimer an. interme. iate waint coatD awwrowriate 4br DubDtrate over tpe watcp, an. awwly 4nal waint coat over entire unbrohen Dur4ace containin1 tpe watcp, corner to corner o4 q all an. e. 1e to e. 1e o4 ceilin19 Provi. e a. . itional coatDuntil watcp blen. Dq itp a. jacent Dur4aceD9
 - B9 Ceilin1D Patcp, rewair, or repan1 inSwlace ceilin1D aD neceDDary to wrovi. e an evenSwlane Dur4ace o4uni4brm awwearance9
 - k9 Qdterior "uil. in1 QncloDure: Patcp comwonentD in a manner tpat reDoreD encloDure to a q eatperti1pt con. ition an. enDureD tpermal an. moiDure inte1rity o4buil. in1 encloDure9
- H9 Cleanin1: Clean areaDan. DwaceDq pere cuttin1 an. watcpin1 are wer4prme. 9Remove waint, mortar, oilD, wutty, an. Dmilar materialD4prime a. jacent 4niDpe. Dur4aceD9
- 39 PREf RQgg CLQANINf
 - A9 Clean Project Dte an. q orh areaD . aily, inclu. in1 common areaD9 Qn4brce resuirementDDtrictly9; iDwoDe o4materialDlaq 4Jlly9
 - M9 Comwly qitp resuirementD in NFPA 2BM 4br removal o4 combuDtible qaDte materialDan. . ebriD9
 - 29 ; o not pol. q aDte materialD more tpan Deven . ayD . urin1 normal q eatper or tpree . ayDi4tpe temwerature iDedwecte. to riDe above x0 . e1 F9
 - 39 Containeri5e pa5ar. ouD an. unDanitary q aDte materialD Dewarately 4om otper q aDte9 Oarh containerD awwrowriately an. . iDwoDe o4 le1ally, accor. in1 to re1ulationD9
 - a9 TDe containerDinten. e. 4or pol. in1 q aDte materialDo4tywe to be Dtore. 9
 - B9 Coor. inate wro1reDD cleanin1 4br jointSuDe areaD q pere Contractor an. otper contractorDare q orhin1 concurrently9
 - "9 gite: Oaintain Project Dite 4ee o4q aDte materialDan. . ebriD9

- C9 Worh AreaD. Clean areaD q pere Worh iD in wro1reDD to tpe level o4 cleanlineDD neceDDary 4br wrower edecution o4tpe Worh9
 - M9 Remove lisui. DwillDwromwtly9
 - 29 Wpere . uDt q oul. imwair wrower edecution o4tpe Worh, broom&lean or vacuum tpe entire q orh area, aDawwrowriate9
- ; 9 InDtalle. Worh: Xeew inDtalle. q orh clean9Clean inDtalle. Dur4aceDaccor. in1 to q ritten inDtructionD o4 manu4acturer or 4abricator o4 wro. uct inDtalle., uDin1 only cleanin1 materialD Dweci4cally recommen. e. 9 I4 Dweci4c cleanin1 materialD are not recommen. e., uDe cleanin1 materialDtpat are not pa5ar. ouD to pealtp or wrowerty an. tpat q ill not . ama1e edwoDe. Dur4aceD9
- Q9 Conceale. gwaceD. Remove . ebriD 4rom conceale. DwaceD be4bre encloDin1 tpe Dwace9
- F9 QdwoDe. gur4aceD. Clean edwoDe. Dur4aceD an. wrotect aD neceDDary to enDure 4ree. om 4rom . ama1e an. . eterioration at time o4gubDtantial Comwletion9
- f 9 WaDte ; iDwoDal: ; o not bury or burn qaDte materialD on SDite9 ; o not qaDp qaDte materialD. oq n Deq erD or into qaterqayD9Comwly qitp qaDte . iDwoDal resuirementD in gection 0M7B M zConDtruction WaDte Oana1ement an. ; iDwoDal9z
- H9 ; urin1 pan. lin1 an. inDtallation, clean an. wrotect conDtruction in wro1reDD an. a. joinin1 materialD alrea. y in wlace9 Awwly wrotective coverin1 q pere resuire. to enDure wrotection 4rom . ama1e or . eterioration at gubDtantial Comwletion9
- 19 Clean an. wrovi. e maintenance on comwlete. conDtruction aD4esuently aDneceDDary tprou1p tpe remain. er o4 tpe conDtruction werio. 9 A. juDt an. lubricate owerable comwonentDto enDure owerability q itpout . ama1in1 e4ectD9
- 89 Limitin1 QdwoDureD guwerviDe conDtruction owerationD to enDure tpat no wart o4 tpe conDtruction, comwlete. or in wro1reDD, iD Dubject to parm4ul, . an1erouD, . ama1in1, or otperq iDe . eleteriouDedwoDure . urin1 tpe conDtruction werio. 9
- 397 gYARYINf AN; A; 8TgYINf
 - A9 Coor. inate Dtartuw an. a. juDtin1 o4 esuiwment an. oweratin1 comwonentD q itp resuirementDin g ection 0M- MM8 zf eneral CommiDDonin1 ResuirementD9z
 - "9 gtart esuiwment an. oweratin1 comwonentD to con4rm wrower oweration9 Remove mal4unctionin1 unitD, rewlace q itp neq unitD, an. reteDt9
 - C9 A. juDt esuiwment 4pr wrower oweration9 A. juDt oweratin1 comwonentD 4pr wrower oweration q itpout bin. in19
 - ; 9 YeDt eacp wiece o4esuiwment to veri4y wrower oweration9YeDt an. a. juDt controlD an. Da4etieD9Rewlace . ama1e. an. mal4unctionin1 controlDan. esuiwment9
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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.
- 1.4 ACTION SUBMITTALS
 - A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- 1.5 CLOSEOUT SUBMITTALS
 - A. Certificates of Release: From authorities having jurisdiction.
 - B. Certificate of Insurance: For continuing coverage.
 - C. Field Report: For pest-control inspection.

CLOSEOUT PROCEDURES 01 77 00 - Page 1 of 5

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect . Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
 - 6. Advise Owner of changeover in utility services.

- 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
- 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- 9. Complete final cleaning requirements.
- 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
 - 1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.9 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 - 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

CLOSEOUT PROCEDURES 01 77 00 - Page 3 of 5

- 4. Submit list of incomplete items in the following format:
 - a. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit by uploading to web-based project software site .
- E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

- 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, eventextured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - i. Vacuum and mop concrete.
 - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - I. Remove labels that are not permanent.
 - m. Wipe surfaces of mechanical and electrical equipment , elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - r. Clean strainers.
 - s. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for final property survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
- 1.3 CLOSEOUT SUBMITTALS
 - A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one set(s) of file prints.
 - b. Final Submittal:
 - 1) Submit Record Digital Data Files and three set(s) of Record Digital Data File plots.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.

- d. Record and check the markup before enclosing concealed installations.
- e. Cross-reference record prints to corresponding photographic documentation.
- 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Duct size and routing.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or Construction Change Directive.
 - j. Changes made following Architect's written orders.
 - k. Details not on the original Contract Drawings.
 - I. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect for resolution.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 4. Identification: As follows:
 - a. Project name.

PROJECT RECORD DOCUMENTS 01 78 39 - Page 2 of 3

- b. Date.
- c. Designation "PROJECT RECORD DRAWINGS."
- d. Name of Architect.
- e. Name of Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39


SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.
- 1.2 MATERIALS OWNERSHIP
 - A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- 1.3 PREINSTALLATION MEETINGS
 - A. Predemolition Conference: Conduct conference at Project site .
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for asbestos control, dust control and, for noise control. Indicate proposed locations and construction of barriers.
 - B. Schedule of selective demolition activities with starting and ending dates for each activity.
- 1.5 CLOSEOUT SUBMITTALS
 - A. Inventory of items that have been removed and salvaged.
- 1.6 FIELD CONDITIONS
 - A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
 - B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. To be coordinated with Owner.
 - C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
 - D. Hazardous Materials: It is expected for there to be hazardous materials encountered in the Work.
 - 1. Asbestos in the rooms will need to be removed and disposed of safely.

- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.
- G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
 - A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
 - B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Inventory and record the condition of items to be removed and salvaged.
- 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
 - A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

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

3.3 PROTECTION

- A. Remove temporary barricades and protections where hazards no longer exist.
- 3.4 SELECTIVE DEMOLITION
 - A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
 - B. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
 - C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 CLEANING

A. Remove demolition waste materials from Project site and dispose of them in an EPAapproved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."

- 1. Do not allow demolished materials to accumulate on-site.
- 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

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SECTION 02 51 00 ASBESTOS ABATEMENT & RELATED WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. General provisions of the Contract, including General and Supplementary Conditions and Other Abatement Specification Sections, apply to the work of each of the Specification Sections.
- B. This section addresses abatement of asbestos-containing material (ACM) only.
- C. Hazardous Building Materials Inspection Report; Provided by Owner.

1.2 PROJECT SCOPE-OF-WORK

- A. General: Furnish all labor, materials, equipment and perform all work required to safely remove, and otherwise abate as indicated herein, transport, and legally dispose of the asbestos-containing materials (ACM). The scope-of-work includes the removal, transport, and disposal of designated ACM at the River Valley Community College, located at 1 College PI in Claremont, NH. All work is to be completed in accordance with the schedules stated herein, in the Contract Documents, and as designated by River Valley Community College. It is essential that all work be phased and scheduled as required to facilitate Owner's renovation and upgrade work. All work is to be completed in strict accordance with applicable local, State of New Hampshire (State), and federal codes and regulations and the requirements stated in this specification and Contract Documents.
- B. Reference demolition drawings and full inspection reports for discussions and additional information and limitations of Owner survey.
- C. The work areas have or may have other regulated or hazardous materials present that are not covered in the Section including but not limited to polychlorinated biphenyl (PCB)-containing materials, mercury, lead paint, guano, mold contamination, other hazardous materials and universal waste. Contractor's OSHA-competent person shall also inspect the work place for other potential hazardous building material during the work. If encountered during the work immediately notify Owner's Representative. Use only qualified, trained workers to properly remove, package, transport, and dispose (or recycle) of such material in strict compliance with all local, State, and Federal requirements.

1.3 WORK SCHEDULES

- A. All work shall be completed in accordance with the schedule requirements as indicated by the Owner and as stated in the Contract Documents.
- B. All work shall be strictly coordinated and scheduled by the Contractor as indicated by and approved by Owner, the Owner's industrial hygiene consultant (IH Consultant), and General Contractor. Work is to be phased as required to facilitate Owner operations, general occupancy of the site, and general construction activity. Contractor must provide proposed daily schedules to Owner and IH Consultant for each phase of work and each Owner work request. Adequate advance notice shall be provided to Owner and the IH Consultant prior to any schedule changes. Start and completion dates for the work and specific phasing requirements not otherwise specified herein shall be submitted to Owner and IH Consultant for approval.

1.4 CONTRACTOR ESTIMATES

A. Estimates: Contractor shall conduct necessary field measurements and site review as deemed necessary by Contractor to delineate the scope of work and site conditions prior to submittal of bid. Contractor shall note on bid any discrepancies between Contractor field measurements and listings of work stated herein. It is the responsibility of the Contractor to verify all project information and site conditions as necessary to satisfy the Contractor as to the requirements of the work for each specific phase of the project. The Contractor must notify Owner and the IH Consultant of any conflicting information or clarifications required for the preparation of any bids, estimates, and submittal documentation. Unless otherwise stated by Owner, the Contractor is responsible for the removal of all designated ACM at Owner facility, so designated by the Owner.

1.5 EXISTING CONDITIONS

A. Prior to commencement of work, inspect areas in which work will be performed. Prepare a listing and photographs of damage to structure, surfaces, finishes, insulations, and equipment that could be misconstrued as damage resulting from the work. Contractor is responsible for all damages to equipment, furnishings, finishes and building surfaces in the work area and adjacent caused by the Contractor during the course of abatement and general housecleaning. Contractor is responsible for completing all repairs to damaged items/surfaces caused by the work. In addition, all tape, adhesive, and other staining and damage must be fully repaired by Contractor to meet or exceed existing conditions.

1.6 POTENTIAL ASBESTOS HAZARD

- A. The work site contains ACM. Review all site survey reports and conduct ongoing inspections of the work areas to identity potential hazardous material that may be encountered. Provide OSHA competent person to supervise and review work procedures and conduct ongoing work area inspections. Properly train all affected personnel at the job site based on the hazards and hazardous material to be encountered, impacted or disturbed including but not limited to ACM.
- B. The disturbance or dislocation of ACM may cause asbestos fibers to be released into the buildings atmosphere, thereby creating potential health hazards to workmen and building occupants. Apprise all employers at site, workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazards, other possible site hazards, and of proper work procedures that must be followed.
- C. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos fibers and dust. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.
- D. Complete, and coordinate with Owner's Representative as applicable, all communication of hazards in strict accordance with 29 CFR 1926.1101 (k) and other applicable OSHA and State regulations. The contractor shall coordinate with Owner's Representative to review all existing inspection records and testing results as needed. Ensure that complete inspections of the space and affected materials have been completed of copies of inspection reports have been provided to the Owner, Contractor site supervisor and other affected contractors and subcontractors at the site as applicable. All site personnel working in areas containing ACM shall be apprised of the locations, types and quantities of ACM present and all such personnel shall be provided a minimum of asbestos awareness level training (for non-asbestos contractors) or additional training as indicated

herein. In the event that other suspect material are encountered (or previously inaccessible spaces are accessed) that are not identified in the inspection report as having been properly inventoried and testing, then immediately cease work that would impact such materials and notify Owner's Representative such that proper testing and inspection can be performed.

1.7 CONTRACTOR USE OF PREMISES

- A. General: The Contractor shall limit his use of the site to the work indicated, so as to allow for Owner operations and general construction activity. Confine operations at the site to the specified work areas of the Specification. Take all precautions necessary to protect the site, buildings, any occupants, and surrounding areas from work-related hazards during the construction period. Maintain building in a safe and structurally sound condition throughout the work. Maintain access to the public and other trades in designated areas (for example, stairwells) as indicated herein and as otherwise noted by Owner. Provide additional barriers and site security as needed to accommodate such access. Use care to prevent damages to existing surfaces during installation of solid barriers, critical barriers and primary isolation barriers.
- B. Install solid barriers to prevent unauthorized access and visibility from adjacent, public or Owner occupied areas as designated by Owner and using materials and construction methods approved by Owner. Contractor shall work in cooperation with, and coordinate all work with.

1.8 STOP WORK

A. If Owner or the IH Consultant presents a written or verbal stop work order immediately and automatically stop all work. Do not recommence work until authorized in writing by Owner and IH Consultant.

1.9 PROJECT COORDINATION

- A. Site Supervisor: Provide a full-time Site Supervisor who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Contractor's Representative responsible for compliance with the specification and all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials.
 - 1. Experience and Training: The Site Supervisor must have completed a course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, and have had a minimum of five (5) years on-the-job training in similar asbestos abatement procedures.
 - Accreditation/Qualifications: The Site Supervisor is to be (1) a Competent Person as required by OSHA in 29 CFR 1926, and (2) accredited and certified in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C; and (3) licensed in accordance with current State requirements.
- B. Project Manager: Provide a qualified and experienced project manager to perform administrative and project management responsibilities and to serve as Contractor management point of contact in addition to the project supervisor.
- C. Pre-Construction Conference: An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by Owner with Contractor prior to the start of work for each phase. This meeting will be held to review the scope-of-work, scheduling, coordination, and contractor plan of action and submittals and other applicable items.

- D. Daily Log: Maintain at the work area a daily log documenting the dates and time of but not limited to, the following items:
 - 1. Visitations; authorized and unauthorized
 - 2. Daily sign-in sheet for all personnel entering and leaving the work area (name, certification, expirations).
 - 3. Special or unusual events, i.e. barrier breaching, equipment failures, accidents
 - 4. Documentation of the following:
 - a) Supervisor's daily inspections and exposure monitoring test results
 - b) Work progress each day for each work area
 - c) Removal of waste material (number and type of containers) from each work area
 - d) Removal of waste from site including a copy of the accompanying waste shipment record
 - e) Decontamination of work area and equipment
 - f) Final inspection and air clearance results, and
 - g) Documentation of containment removal and final general housecleaning activity
 - 5. Complete and maintain daily log in accordance with applicable State and federal record keeping requirements. Provide access to logs to Owner and IH Consultant at all times and provide copies of logs with the submittal package in accordance with the construction submittal requirements.

1.10 STANDARDS

- A. Applicability of Standards: It is the Contractor's responsibility to complete all work in accordance with (or exceeding) all applicable industry standards and guidelines. Except where Contract Documents include more stringent requirements, all applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents. Applicable construction standards are made a part of the Contract Documents by reference. Where compliance with an industry standard is required, comply with the most current standards in effect as of date of Contract Documents.
- B. Conflicting Requirements: Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer to Owner and IH Consultant any requirements that are different or conflicting; outline the more stringent requirement before proceeding.
- C. Comply with applicable standards including, but not limited to, American National Standards Institute (ANSI) standards and American Society for Testing and Materials (ASTM) standards.

1.11 CODES, REGULATIONS, AND STANDARDS

- A. Adhere to work practices and procedures set forth in applicable codes, regulations and standards related to work. Obtain permits, licenses, inspections, and similar documentation, as well as payments and similar requirements associated with codes, regulations, and standards. Update permits as necessary.
- B. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection

of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold Owner and IH Consultant harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.

- C. All work performed under this contract shall comply with applicable provisions, including most current versions, and not limited to the listed and all other applicable local, state and federal codes and regulations.
- D. Federal Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, including but not limited to:

- 1. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules
- 2. 29 CFR 1910.1001 and 29 CFR Part 1926.1101
- 3. Respiratory Protection: Title 29, Part 1910, Section 134 of the CFR
- 4. Construction Industry: Title 29, Part 1926, of the CFR and all related Subparts
- 5. Access to Employee Exposure and Medical Records: 29 CFR, Part 1910, Section 2
- 6. Hazard Communication: Title 29, Part 1910, Section 1200 of the CFR
- 7. Specifications for Accident Prevention Signs and Tags: 29 CFR Part 1910, Sec. 145

DOT: U. S. Department of Transportation, including but not limited to:

1. Hazardous Material Regulations: Title 49, Part 171-180 CFR

EPA: U. S. Environmental Protection Agency (EPA), including but not limited to:

- 1. Asbestos Abatement Projects; Worker Protection Rule: Title 40 Part 763, Sub-part G
- 2. Asbestos School Hazard Abatement Reauthorization Act (ASHARA)
- 3. Asbestos Containing Materials in Schools Final Rule 40 CFR Part 763, Sub-part E
- 4. National Emission Standard for Hazardous Air Pollutants (NESHAPS); National Emission Standard for Asbestos, 40 CFR Part 61, Sub-part A, and Sub-part M (Revised Sub-part B)
- E. Local Requirements: Abide by all local requirement that govern asbestos abatement work or hauling and disposal of asbestos waste materials.
- F. State of New Hampshire Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:
 - 1. Asbestos Management and Control, N.H. Admn. Rules Ch. Env-A 1800
 - 2. Asbestos Management and Control, N.H. RSA Ch. 141-E
 - 3. Solid Waste Management Act, N.H. RSA Ch. 149-M and N.H.RSA Ch. 147-A
 - 4. N.H. Admin. Rules Ch. Env-Sw 400-1200 and 2100-2800; and Env-Hw 100-300

1.12 DEFINITIONS

A. General Definitions: Definitions contained in this Section are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Documents.

- 1. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by Owner's representative", "requested by the "IH Consultant", and similar phrases. However, no implied meaning shall be interpreted to extend the IH Consultant's responsibility into the Contractor's area of construction supervision.
- 2. Approve: The term "approved," where used in conjunction with the Owner or the IH Consultant's action on the Contractor's submittals, applications, and requests, is limited to the responsibilities and duties of the IH Consultant as indicated in the Contract Documents. Such approval or acceptances do not express or claim any certification of completeness, compliance, or approval of programs and documentation, including but not limited to review of analytical results, historical information, and interpretations. Such approval shall not release the Contractor from responsibility to fulfill Contract Document requirements, unless otherwise provided in the Contract Documents.
- 3. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."
- 4. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, and protecting, cleaning and similar operations."
- 5. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."
- 6. Installer: An "Installer" is an entity engaged by the Contractor, either as an employee, subcontractor or sub- subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- 7. IH Consultant: This is the entity employed or engaged as industrial hygiene consultant as described in the Contract Documents. All references to Owner's Consultant, Air Monitoring Consultant, or Consultant with regard to asbestos abatement in the Contract Documents in all cases refer to the IH Consultant. The IH Consultant will represent Owner during abatement and until final payment is due. The Owner representative may also constitute other persons representing Owner, other than the IH Consultant or consultant, as indicated by Owner. Owner's instructions to the Contractor will be made directly to the Contractor.
- 8. Site Supervisor: This is the Contractor's Representative at the work site. This person will be the Competent Person required by OSHA in 29 CFR 1926 and licensed Site Supervisor/Foreman as required by the State. Provide licensed supervisor at each individual work site during work.
- B. Definitions Asbestos Abatement:
 - 1. Accredited or Accreditation (when referring to a person or laboratory): A person or laboratory accredited in accordance with section 206 of Title II of the Toxic Substances Control Act (TSCA).
 - Adequately Wet: Means sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from the asbestos-containing material, then that material has not been adequately wetted. The absence of visible emissions is not sufficient evidence, or measure, of a material being adequately wet.
 - 3. Air Monitoring: The process of measuring the fiber content of a specific volume of air.

- 4. Amended Water: Water to which a surfactant has been added to decrease the surface tension to 35 or less dynes.
- 5. Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
- 6. Asbestos-Containing Material (ACM): Any material containing more than 1% of asbestos of any type or mixture of types.
- 7. Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or misc. ACM in or on interior structure or other parts of a building.
- 8. Asbestos-Containing Waste Material: Any material that is or is suspected of being or any material contaminated with an asbestos-containing material that is to be removed from a work area for disposal. May also be referred to as "asbestos waste".
- Asbestos debris: Pieces of ACBM or ACM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM or reasonably likely to have asbestos fibers present under conditions present and based on work operations.
- 10. Authorized Visitor: Owner, the IH Consultant, testing lab personnel, emergency personnel or a representative of any federal, state and local regulatory or other agency having authority over the project.
- 11. Barrier: Any surface that seals off the work area to inhibit the movement of fibers.
- 12. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
- 13. Category I Non-Friable ACM: means ACM packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos. Also see definition for Regulated ACM.
- 14. Category II Non-Friable ACM: means any non-friable ACM, except for Category I NonFriable ACM.
- 15. Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.
- 16. Critical Barrier: Polyethylene sheeting, typically 6-mil polyethylene sheeting, over windows, doors, and air passageways separating the work area from non work area portions of the building. Critical barriers remain in place until clearance testing or inspections are completed and results meet clearance test criteria.
- 17. Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.

- 18. Disposal Bag: A properly labeled 6 mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site.
- 19. Contractor: The contractor engaged by Owner to perform asbestos related activities must be licensed by the State, as applicable, and in accordance with NH Admn. Rule Env-A 1800. All workers and site supervisors engaging in asbestos activity must also be trained and licensed in accordance with current State regulations and 40 CFR Part 763 (AHERA).
- 20. Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.
 - a) Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.
 - b) Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.
- 21. Encapsulation: Treatment of asbestos-containing materials, with an encapsulant and application of appropriate post removal encapsulant on substrate and containment barriers.
- 22. Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestoscontaining material to control the release of asbestos fibers into the air.
- 23. Excursion Limit: Ensure that no employee is exposed to airborne concentrations of asbestos in excess of 1.0 fibers per cubic centimeter of air (1.0 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by PCM analysis in accordance with NIOSH Method 7400 and as indicated in 29 CFR Part 1926. Also referred to as the short-term exposure limit, (STEL).
- 24. Friable Asbestos Material: Material that contains more than 1.0% asbestos and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. This also includes materials which, when subjected to removal methods and other disturbances, may release fibers and dust due to the abatement actions.
- 25. Glovebags: Glovebags for removal of insulation in accordance with 29 CFR Part 1926.
- 26. HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in diameter.
- 27. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
- 28. Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
- 29. Permissible exposure limit (PEL): the Contractor shall ensure that no employee is exposed to an airborne fiber concentration of asbestos in excess of 0.1 f/cc of air as an eight (8) hour timeweighted average (TWA) in accordance with 29 CFR Part 1926.
- 30. Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
- 31. Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the Work Area at a lower

pressure than any adjacent area, and which cleans re-circulated air or generates a constant air flow from adjacent areas into the Work Area.

- 32. Regulated ACM (RACM): RACM means friable ACM, Category I Non-friable ACM that has been rendered friable, Category I ACM that will be or has been subjected to sanding, cutting, grinding, or abrading (abrasive action), or Category II Non-friable ACM that has a high probability of becoming, or has become, crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of renovation or demolition operations. Grinding means breaking into small pieces or fragments.
- 33. Repair: Returning damaged ACBM or ACM to an undamaged condition or to an intact state so as to prevent fiber release.
- 34. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
- 35. Time Weighted Average (TWA): The average concentration of a contaminant in air during a specific time period.
- 36. Visible Emissions: Any emissions, coming from RACM, ACM, ACBM, asbestos debris or asbestos waste material, which is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
- 37. Waste Shipment Record: Means the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of Asbestos waste.
- 38. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using clothes, mops, or other cleaning utensils which have been dampened with amended water and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.
- 39. Work Area: The area where asbestos-related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

1.13 NOTICES

- A. U.S. Environmental Protection Agency: Send proper written notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAPS Contact -Reno/Demo Clerk - at least 10 working days prior to beginning any work which will directly or indirectly result in disturbance of asbestos-containing materials. Post notifications at job site.
- B. State and Local Agencies: Send written notification as required by state and local regulations prior to beginning any work on asbestos-containing materials. At least 10 working days prior to the start of work, submit appropriate notification to the New Hampshire Department of Environmental Services, Air Resources Division. Post notifications at job site.
- C. Permits: Obtain all local, state and federal permits necessary to conduct the work of this specification. Obtain water permits as necessary for release of any water originating from the Work. Notify all local emergency agencies of the abatement work to be completed as

required. All asbestos containing waste is to be transported by an entity maintaining a current "DOT Common Hauler Permit" specifically for asbestos-containing materials, as required for transporting of waste asbestos-containing materials to a disposal site.

- D. Licenses: Maintain current licenses as required by applicable state and local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract. Post all company, supervisor, and worker licenses at work area entrance.
- E. Posting and Filing of Regulations: Post all notices required by applicable federal, state and local regulations. Maintain at least one (1) copy of applicable federal, state and local regulations and standards at each job site. Post copies of the specification at the job site.
- F. Coordinate with Owner and local fire department authorities the notification and handling of heat and smoke detectors in the work areas, including sealing of detectors during work and removal of seals at the completion of work or shifts.

1.14 SUBMITTAL REQUIREMENTS

- A. Submittal Schedule: Submittals will be provided by the Contractor as specified herein including (1) Preconstruction Submittal Documentation prior to start of work and (2) Project Closeout Submittals within 25 days upon completion of on-site work. Submit ongoing submittals as required herein and as specified by the Owner and IH Consultant. Provide at the job site a copy of all current submittal packages and related documentation. Ongoing submittals will also be submitted during the work as required to update the Pre-construction and Closeout submittals including, but not limited to:
 - 1. Schedule or phasing changes, including description and explanations as applicable.
 - 2. Proposed alternative work methods. Requests for revisions in work procedures must be approved by the Owner and IH Consultant.
 - 3. Updated notifications and permitting.
 - 4. Changes to licenses and training records for all personnel at the site
 - 5. Other changes or revisions to the submittals.
- B. Submittal Preparation
 - 1. Package and furnish to Owner and IH Consultant each submittal appropriately. Submittal packages shall be in a neat and orderly fashion, will include an index, and shall be compiled in the order requested herein. Clearly mark and label all sections of the submittal documents.
 - 2. In the event that a submittal package does not meet the requirements herein the submittal may not be accepted and the Contractor will make necessary revisions and re-submit the submittal documents.
 - 3. By "approval" or acceptance of submittals, Owner and IH Consultant do not express or claim any certification of completeness, compliance, or approval of programs and documentation, not limited to review of analytical results, historical information, regulatory compliance, and interpretations. Contractor is solely responsible for

compliance with Specification and regulatory requirements associated with the work and submittal documentation.

- C. Preconstruction Submittal Documentation
 - 1. Provide the following Preconstruction Submittal Documentation prior to the start of each phase of work:
 - a) Notifications: Copies of EPA, State, and local notifications.
 - b) Waste Hauler and Landfill Permits and notifications. Submit names, address, and licenses/permits for the waste hauler(s) and disposal facilities.
 - c) Names, addresses, experience, and references for any subcontractors the Contractor proposes to utilize for Work. Indicate if any asbestos workers or supervisors to be used for Work are subcontracted labor.
 - d) Names and 24-hour phone numbers/pagers for Project Supervisor and other key personnel for the Contractor. Post emergency contact information at Decontamination Unit entrance.
 - e) List of personnel to be on-site. Copies of all company, supervisor, and worker licenses, training and certifications required in accordance with this Specification.
 - f) Notarized Certifications: Submit notarized certification signed by an officer of the Contract stating that exposure measurements, respiratory protection programs, medical surveillance, worker training, and recordkeeping has and will be completed and maintained during the Work for all involved personnel in accordance with 29 CFR Part 1926 and other applicable State and federal regulations.
 - g) Certify the dates for primary and secondary HEPA filter changes for all negative air units.
 - h) Level of respiratory protection anticipated for each operation required by the project. Include supporting documentation of previous exposure monitoring on a sufficient number similar project and operations in accordance with OSHA requirements.
 - i) Detailed schedule and phasing, containment layouts, and summary of approach; detail of any special work procedures or methods to be used if not included or addressed in the abatement specification.
 - j) Safety Data Sheets: for all materials to be used on-site not limited to encapsulants, spray adhesives, and other related work material. Note: It is Contractor's responsibility to notify all other contractors and parties in accordance with applicable OSHA hazard communication regulations.
 - k) Contingency Plan: Prepare a site-specific contingency plan for emergencies including fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. The emergency contingency plan must be in accordance (meet or exceed the requirements of) with applicable OSHA requirements.
 - I) Other submittals required by the Contract Documents or as indicated by Owner.
- D. Closeout Submittals
 - 1. The following Closeout Submittals will be provided upon substantial completion of Work.
 - a) Copies of all daily logs in accordance with Section 1.9 Project Coordination of this specification;

- b) A copy of each waste shipment record, hazardous waste manifest, and chain-ofcustody form, signed by the transporter and disposal facility operator, indicating that waste was packaged and disposed of properly. Include a description of any temporary storage facilities used including, dates, times, and locations of temporary storage. Note: In accordance with NESHAPS, submit all waste shipment documentation within 35 days from transport of waste from the site (provide interim submittals during the work as needed to comply with federal regulations). Note: copies of waste shipment records in progress shall also be provided to IH Consultant and Owner immediately upon removal of waste from site.
- c) Complete copy of all revisions and changes to the Pre-Construction Submittals.
- d) Copy of other written construction documents such as Change Orders and work modifications issued in printed form during construction. Mark these documents and a site drawing to show the work completed and to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications.

1.15 AIR MONITORING

- A. Ambient Area Air Monitoring: IH Consultant will/may monitor ambient area airborne fiber counts in and around the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations that may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers and to monitor concentrations outside the containment or work area perimeter.
- B. Clearance Air Monitoring: Refer to Work Area Clearance section of this specification.
- C. Stop Action Levels
 - 1. Inside Work Area: Maintain an average airborne count in the Work Area of less than 0.10 fibers per cubic centimeter. If the fiber counts rise above this figure for any sample taken, revise work procedures and engineering controls to lower fiber counts.
 - 2. Outside Work Area: If any air sample taken outside of the Work Area exceeds 0.010 f/cc, immediately and automatically stop all work except corrective action necessary to address elevated concentrations. If it is determined by Owner or IH Consultant that the elevated concentration was the result of a failure of Work Area isolation measures or Contractor work methods, initiate the following actions:
 - a) Erect additional critical barriers to isolate the affected area
 - b) Install HEPA filtration negative air units in affected area
 - c) Decontaminate the affected area in accordance with appropriate cleaning procedures.
 - d) Require that respiratory protection and personal protective equipment is used in affected area until area is cleared for re-occupancy in accordance with the work area clearance requirements.
 - 3. Effect on Contract Sum: Complete corrective work with no change in the Contract Price or Sum if high airborne fiber counts were caused by Contractor activities.
- D. Analytical Methods: Owner reserves the right to use either phase contrast microscopy (PCM) and/or transmission electron microscopy (TEM) to analyze air samples. PCM analysis will be performed using the NIOSH 7400 method at the job site or at an off-site laboratory. TEM may also be used as Owner deems necessary for ambient area air

samples using the analysis method as determined by IH Consultant. Also see Work Area Clearance section.

- E. Schedule of Air Samples
 - 1. Prior to the start of work: The IH Consultant may collect air samples to establish a base line before start of work. Base line is an action level expressed in fibers per cubic centimeter that is twenty-five percent greater than the largest of the following:
 - a) Average of the PCM samples collected outside each Work Area
 - b) Average of the PCM samples collected outside the building
 - c) And 0.010 f/cc
 - 2. Daily: From start of work involving Temporary Enclosures through the work of Project Decontamination, IH Consultant may be collecting samples during the Work, including but not necessarily limited to:
 - a) At HEPA Exhaust areas
 - b) Non work-area portions of the building
 - c) At entrance to the Decontamination Unit
 - d) Outside the building
 - e) Clearance sampling: See the Air Clearance Requirements.
- F. Laboratory Testing:
 - 1. The services of a testing laboratory will be employed by Owner to perform laboratory analyses of the air samples. Samples will be sent overnight on a daily basis, so that verbal reports on air samples can be obtained within 24 hours. Results of all air monitoring tests will be available at the job site on a daily basis.
- G. OSHA Monitoring and Additional Testing:
 - 1. Additional Testing: The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to Owner.
 - 2. OSHA Compliance and Ambient Area Monitoring: Contractor must provide for collection and laboratory analysis services of Contractor's OSHA personal exposure samples, including daily TWA and STEL monitoring for asbestos and other contaminants resulting from the Work, including but not limited to carbon monoxide, volatile organic compounds, and chemical exposures.

1.16 TEMPORARY FACILITIES

- A. General: Provide temporary connection to existing building utilities or provide temporary facilities as required to complete work. Owner must approve all connections to utilities and facility components. Provide temporary portable water and power sources for all exterior work as indicated and coordinated with Owner, as applicable.
- B. Water Service:

- 1. Temporary Water Service Connection: Provide hot and cold water to the Work Area. Provide a qualified and experienced licensed plumber as necessary to complete all water service work in conformance with applicable building codes and regulations.
- 2. All connections to the Owner's water system shall include back-flow protection. Monitor for leaks and repair or replace as needed.
- 3. Water Hoses: Employ suitable heavy-duty abrasion-resistant hoses to provide water into each work area and to each Decontamination Unit.
- C. Electrical Service:
 - 1. General: Provide a qualified and experienced licensed electrician to complete all electrical service work. Comply with applicable OSHA, NEMA, NECA, UL and other industry standards and governing regulations for materials and layout of temporary electric service. Provide adequate temporary power to the Work Area sized and equipped to accommodate all electrical equipment required for completion of the work and related testing and inspections. Provide temporary electrical panel as needed sized and equipped to accommodate all electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical system. Protect with circuit breaker or fused disconnect. Locate temporary panel outside of the work area and in a location acceptable to Owner. Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI).
 - 2. Lamps and Light Fixtures: Provide appropriate temporary work area lighting. Protect lamps with guard cages or tempered glass enclosures where fixtures are exposed to breakage by construction operations.
- D. First Aid: Comply with governing regulations and recognized recommendations within the construction industry. Provide appropriate first aid supplies.
- E. Fire Extinguishers: Provide appropriate fire extinguishers for temporary offices, storage, work areas and other portions of the site occupied or used by Contractor for the work.
- F. Execution: Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work. Coordinate all such work with Owner. Require that tradesmen be licensed as required by local authorities. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

1.17 PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

- A. Continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area. Maintain accurate records of time and locations of testing onsite and in daily logs.
- B. HEPA Filtered Fan Units: Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Units must meet the requirements of all applicable regulations and standards.

1.18 WORKER PROTECTION

- A. Comply with respiratory protection requirements as specified in this specification and applicable regulations. Provide worker protection as required by the most stringent OSHA and/or EPA regulations and industry standards applicable to the work. The following procedures are minimum requirements to be adhered to regardless of fiber concentrations in the Work Area.
- B. Worker Training
 - 1. AHERA Accreditation: All workers are to be accredited as Abatement Workers as required by the AHERA regulation 40 CFR 763 Appendix C to Subpart E, April 30, 1987. All training must be current including current annual refresher training.
 - 2. Train all supervisors and workers in accordance with EPA NESHAPs and 29 CFR Part 1926 (OSHA) for asbestos and other hazards anticipated during the work. All workers and supervisors must be licensed and certified as required by applicable State regulations.
- C. Medical Examinations: Provide medical examinations for all workers who will enter the Work Area for any reason in accordance with OSHA requirements as set forth in 29 CFR 1926 and 29 CFR 1910.20.
- D. Protective Clothing
 - 1. Coveralls: Provide cloth full-body coveralls and hats, and require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment Room of the Personnel Decontamination Unit. Dispose of used coverall as asbestos waste.
 - 2. Other: Provide other personal protective equipment as required by OSHA regulations and industry standards, not limited to: hard hats, eye protection (goggles), gloves, fall safety, and footwear.
- E. Entering Work Area: Each time Work Area is entered, remove all street clothes in the changing (clean) room of the personnel decontamination unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots. Only properly licensed/certified personnel shall enter the decontamination unit and work area. All personnel entering the work area must post their State license at the decontamination unit entrance.
- F. Decontamination Procedures: Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:
 - 1. HEPA vacuum all gross debris from the protective clothing prior to entering the equipment room of the decontamination unit. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.
 - 2. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum:
 - 3. Carefully wash face piece of respirator inside and out. Each worker leaving the work area must shower completely with soap and water. Rinse thoroughly. Proceed from shower to clean room and change into street clothes or into new disposable work items.

- G. Within Work Area: Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. Maintain proper use of personnel protective equipment.
- H. Respiratory Protection: Provide sufficient respiratory protection in accordance with applicable OSHA requirements in addition to ANSI and NIOSH standards. Select proper level of protection based on personnel exposure monitoring and the applicable OSHA Permissible Exposure Limits. Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental.
 - 1. Instruct and train each worker for proper respirator use in accordance with OSHA and other applicable industry standards. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, until the area has been cleared for re-occupancy.
 - 2. Provide and complete all necessary fit testing for respiratory protection in strict accordance with applicable OSHA regulations.
 - 3. In the event that applicable OSHA PEL's (8-hour TWA and 30-minute STEL) are exceeded, stop work. Do not recommence work until work procedures, including use of engineering controls, are modified to maintain exposures within the acceptable PEL's.
- I. Complete all lock-out and tag-out of power and air handling systems within the Work Area in accordance with OSHA regulations. Coordinate all lock-out and tag-out with Owner.

1.19 TEMPORARY ENCLOSURES

- A. Work areas are to be considered contaminated during the work and shall be completely isolated from other locations such that asbestos fibers cannot pass through or beyond the perimeters of the work area and into non work areas. Should areas beyond the work area become contaminated with asbestos as a result of the Contractor's work, the Contractor shall be responsible for cleaning nonwork areas as required. All costs including cleaning, decontaminating, monitoring and testing shall be borne by the contractor.
- B. Contractor shall construct temporary containment enclosures in each work area. Prior to proceeding with ACM abatement coordinate and complete inspections of the work area with the IH Consultant. Proceed with work sequentially as listed or indicated.
- C. Disable ventilating systems or any other system bringing air into or out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means that will prevent accidental premature restarting of equipment as approved by Owner.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Provide new or used materials and equipment that are undamaged and in serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use and in strict compliance with appropriate standards. Do not bring products, materials, and equipment to the Owner's site or Owner work areas that are damaged or contain construction or potential contaminated debris.

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- B. Warning Signs, Caution Signs and Demarcation: Provide all demarcation, warning signs, caution signs, and other postings required for the work and in accordance with State and federal codes and regulations.
- C. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, in 6.0 mil thickness, clear or black as indicated.
- D. Duct Tape: Provide duct tape in 3" widths with an adhesive, which is formulated to stick aggressively to sheet polyethylene.
- E. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- F. Foam Pack: Provide foam pack for sealing small crevices and cracks at critical barriers as required. All foam pack must be approved by Owner and local authorities, not limited to the Fire Department.
- G. Scaffolding: Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions. Equip rungs of all metal ladders, etc. with an abrasive non-slip surface. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.
- H. First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.
- I. Fire Extinguishers: Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.
- J. Wetting Materials: For wetting prior to disturbance of ACM use amended water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.
- K. Encapsulant: Provide suitable encapsulant material intended by manufacturer for the treatment of asbestos and ACM. Provide SDS and manufacture information for products to be used. Ensure that all encapsulant to be applied is suitable for the substrate and condition thereof and is compatible with replacement materials to be installed by Contractor or Owner following the Work.
- L. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled as required by applicable sections of this Specification and federal and state regulations.
- M. Fiberboard Drums of Equivalent: Provide sufficient quantity of fiberboard drums or equivalent (as determined by IH Consultant) for packaging of wire mesh and other contaminated materials with sharp or rough edges.

N. Disposal Bag/Container Labels and Signs: Provide leak-tight waste bags or containers for disposal of asbestos-containing materials with labels in accordance with OSHA, EPA, and the latest revisions to the US Department of Transportation requirements, not limited to material identification number (#NA2212), material packaging group (PGIII), and labels. Warning labels will also include:

Legend:

DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD

- 1. In accordance with NESHAPS, label each waste bag with the name of the waste generator and address where the material was generated. Include the Contractor name and address on each label also. Attach label in a sufficient manner such that they are properly sealed to or on the containers.
- 2. Label all waste bags, containers, and transport vehicles as required by applicable U.S. Department of Transportation Rules and Regulations.
- O. Coveralls: Provide disposable full-body coveralls and head covers in accordance with State and federal regulations. Provide a sufficient number for all required changes, for all workers in the Work Area. Provide sufficient number for use by IH Consultant.
- P. Other PPE: Provide other personal protective equipment as required by OSHA regulations and industry standards, not limited to: hard hats, eye protectives, gloves, and footwear.
- Q. Respiratory Protection: Provide respiratory protection in strict accordance with ANSI Z88.2 1992 "Practices for Respiratory Protection" and 29 CFR 1926 and 1910.134. The respirators will be sanitized and maintained in accordance with manufacturer's specifications and recommendations. Provide sufficient respiratory protection based on applicable ANSI and NIOSH standards. Select proper level of protection based on personnel exposure monitoring and the applicable OSHA Permissible Exposure Limits. Use only respirators and filter that are NIOSH-approved for use with asbestos and other atmospheres anticipated during the work.
- R. Construction Materials: Provide other construction materials such as plywood, strapping, studs, other related abatement materials, etc., as required to complete the work in accordance with this Specification.
- S. All necessary testing and monitoring equipment as applicable to complete work, including but not limited to gas detection equipment, manometers, exposure sampling equipment.

2.2 WATER SERVICE

A. Provide water service as necessary to complete Work in accordance with applicable local, state, and federal building codes and regulations.

2.3 ELECTRICAL SERVICE

A. Provide electric service as necessary to complete Work in accordance with applicable local, state, and federal building codes and regulations.

2.4 PRESSURE DIFFERENTIAL AND FILTRATION

- A. General: Supply the required number of HEPA filtered negative air fan units to the site in accordance with this Specification, industry standards, and applicable State and federal requirements. Use fan units that are intended for asbestos abatement as stated by the manufacturer. Provide HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles or equivalent when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.
- B. Pre-filters: which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required.
- C. Provide appropriate charcoal pre-filters during all work involving use of solvents to minimize odors. Allow HEPA units to run for a sufficient period of time after use of solvents to allow for adequate number of air changes and filtration to adequately dilute odors.
- D. Safety and Warning Devices: Provide units with the appropriate safety and warning devices including but not limited to missing or failure of HEPA filter, automatic shut down in the event of filter rupture or blockage, operating status indicator lights, and audible alarms.

2.6 AUXILIARY GENERATOR

A. Provide adequate, suitable alternative power with a capacity adequate to power a minimum of 50% of the HEPA filtered fan units in operation at any time during the work as needed for emergency use and backup.

PART 3 – EXECUTION

3.1 TEMPORARY ENCLOSURES

- A. Control Access: Isolate the Work Area to prevent entry by building occupants and the public into Work Area. Notify the Owner of all doors and other openings that must be secured to isolate Work Area. Maintain safety access to stairwells and building exits. Construct work area containments and isolation barriers as required allowing for Owner operations and as approved by Owner.
 - 1. Secured Access: Arrange Work Area so that the only access into Work Area is through securable doors to personnel and equipment decontamination units.
 - 2. Solid Construction Barriers: Provide solid construction barriers as indicated by Owner to prohibit unauthorized access and visibility by adjacent occupants and public. At a minimum provide solid barriers as necessary to isolate all work areas with abatement activity from portions of the building to maintain normal Owner operations.
 - 3. Provide Warning Signs at each door and barrier leading to Work Area reading as follows:

Legend:

DANGER KEEP OUT BEYOND THIS POINT CONSTRUCTION WORK IN PROGRESS 4. Immediately inside door (leading to Work Area) and outside all accessible critical barriers post a manufactured asbestos danger sign, approximately 20 inch by 14 inch, displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend: DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

- B. Critical Barriers: Completely separate the Work Area from other portions of the building and the outside by closing and sealing all openings with sheet plastic barriers at least 6 mil in thickness, or by sealing cracks leading out of Work Area with duct tape or equivalent methods. Seal the perimeter of all sheet plastic barriers with duct tape, spray adhesive or other mechanical supports as necessary. Individually seal all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, roof exhausts, and other openings into the Work Area with duct tape. Maintain seal until all work including Project Decontamination is completed. Take care in sealing of lighting and other fixtures, as applicable, to avoid melting or burning of sheeting, as applicable. Coordinate with Owner to provide adequate ventilation to space and equipment that requires air ventilation.
- C. Pressure and Circulation in the Work Area and Decontamination Units
 - 1. Isolate the Work Area from all adjacent areas or systems of the building with a Pressure Differential that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area.
 - 2. Relative Pressure in Work Area: Continuously maintain the work area at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of: 0.02 inches of water. Accomplish the pressure differential by exhausting a sufficient number of HEPA negative air filtered fan units from the work area. Provide sufficient ventilation for a minimum of 8 air changes per hour and sufficient air movement throughout entire containment area.
 - 3. Vent HEPA negative air ventilation units to outside of building. Ensure adequate security and weather tight seals at each exhaust point.
 - 4. Provide a differential pressure meter or manometer to demonstrate the required pressure differential at every barrier separating the Work Area from the balance of the building or outside.
 - 5. Start fan units before beginning work involving disturbance of ACM or debris and run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete and the air clearance criteria has been met.
 - 6. At completion of abatement work, allow fan units to run as specified under Project Decontamination requirements, to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air.

- D. Pre-Clean and Other Preparation Work Area:
 - 1. Complete the following after installation of (1) critical barriers, (2) pressure differential/air filtration systems, and (3) decontamination facilities as indicated below and in other Specification Sections.
 - a) Pre-clean all work area surfaces, fixtures, and equipment using HEPA vacuums and wet wiping.
 - b) Seal non-removable fixtures and equipment with polyethylene sheeting. Provide a minimum of 12" of overlap, sealed with spray adhesive and duct tape on both flap ends, on all joints in the barriers. Do not damage materials and items to be covered.
 - 2. Provide and install transparent inspection windows in the containment barriers as indicated by the IH Consultant. Maintain inspection window clean of debris to allow for inspection of work in progress.
 - 3. Complete other preparation work as necessary to allow for complete precleaning and allow for installation of containment barriers.
- E. Primary Barrier:
 - 1. Do not install primary barriers until all work area surfaces have been pre-cleaned using wet cleaning and HEPA vacuuming.
 - 2. Protect building and other surfaces in the Work Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below. Coordinate with Owner to prevent adequate ventilation to space and equipment that requires air ventilation.
 - 3. Primary Barrier Sheet Plastic: Protect floor surfaces with a minimum of 2 layers of 6-mil plastic sheeting on floors. Provide additional floor protection as required to prevent damage to carpets and other existing flooring surfaces to remain after construction. Protect all existing wall, ceiling, fixed equipment, and other building surfaces with a minimum of 1 layer of 6-mil plastic sheeting in addition to critical barrier systems.
 - a) For work areas with abatement limited to nonfriable flooring only, provide a minimum of
 - 48" (extending up from the floor) polyethylene sheeting barrier as a splash-guard.
 - b) In all cases provide additional barriers and covering as needed to protect building surfaces from damage during the work.
 - 4. Provide a minimum of 12" of overlap, sealed (poly-to-poly) with spray adhesive and duct tape on both flap ends, on all joints in the barriers. Extend floor sheeting up adjoining walls a minimum of 18 inches. Do not place seams at, or within 18" of any wall, ceiling, or floor joints. Stagger all joints by at least 18 inches. Wall and vertical surface poly shall extend over floor sheeting such that floor sheeting extends up the wall and is covered by the wall sheeting overlap.
 - 5. Protect all existing building surfaces and fixed equipment/items, also including non-ACM insulations in the work areas, with a minimum of 2 layers of 6-mil plastic sheet as required to maintain existing conditions and to prevent contamination, water damage, or other damages due to the work. Provide a minimum of 12" of overlap, sealed with spray adhesive and duct tape on both flap ends, on all joints in the barriers.

- F. Seal all ducts and equipment with primary barriers. Isolate and shut down air systems in work area during abatement. Isolate all exterior intakes sufficiently from HEPA exhaust points. Ventilation units and ductwork shall be fully sealed with polyethylene sheeting.
- G. Stop Work: If the Critical or Primary Barrier fails or is breached in any manner stop work immediately and repair the breach as required. Do not start work until authorized by the IH Consultant. Any contamination and/or suspect contamination, as determined by Owner and the IH Consultant, resulting from a breach in the barriers or other neglect by the Contractor shall be thoroughly abated in accordance with this Specification at no additional cost to Owner.
- H. Decontamination Units
 - 1. Provide personnel and equipment decontamination facilities in accordance with State and OSHA regulations and require that the personnel decontamination unit be the only means of ingress and egress for the Work Area (for personnel, waste, equipment and other related items). Provide portable shower units, with continuous dedicated water source, sufficient for personnel decontamination in accordance with State and OSHA regulations, and cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter and final filter.
 - a) Primary Filter Passes particles 20 microns and smaller
 - b) Secondary Filter Passes particles 10 microns and smaller
 - c) Final Filter Passes particles 5 micron and smaller
 - 2. Do not discharge filtered water unless testing and permitting has been completed as applicable in accordance with State and local requirements.
 - 3. Clean debris and residue from inside of Decontamination Units on an ongoing basis.
 - 4. Post an asbestos warning sign at the entrance of the decontamination unit.
 - 5. Adequately secure door to entrance of decontamination unit at the completion or each shift.
- I. Containment Locations
 - 1. Construct and install containment barriers around each work area as coordinated and indicated by Owner and IH Consultant. Do not allow containment location and installation to inhibit access and adequate airflow to all other areas of the building and mechanical equipment. Coordinate with Owner the isolation of mechanical equipment in the work area.

3.3 REMOVAL OF ASBESTOS-CONTAINING MATERIALS

- A. Inspections: Prior to commencing with ACM removal or other ACM disturbance, each individual work area must pass an inspection by the IH Consultant. If deficiencies are observed, immediate correct in a manner satisfactory to IH Consultant.
- B. Maintain all work area isolation and controls during work of this section. The Contractor shall conduct ongoing inspections of the work area, adjacent areas and surrounding areas beneath, as applicable, for containment breaches, leaks or other containment failures. In the event breeches or potential breeches are identified, immediately repair the containment barriers as needed and complete all clean up and decontamination work.

- C. Wet Removal and Waste Packaging General:
 - Thoroughly wet ACM to be removed or otherwise disturbed prior to disturbance, stripping and/or tooling to reduce fiber dispersal into the air. Maintain materials as adequately wetted during Work and as required by NESHAPS. Accomplish wetting by a fine spray (mist) of amended water. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water to penetrate material and seams thoroughly. Spray material repeatedly during the work process to maintain a continuously wet condition.
 - 2. Where necessary, carefully remove ACM while simultaneously spraying amended water to minimize dispersal of asbestos fibers into the air. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels. Do not allow ACM to dry out. As it is removed, simultaneously pack material into appropriate asbestos waste disposal bags/containers. For waste bags, twist neck of waste bags, bend over and seal with minimum three wraps of duct tape. Clean outside of packaging and move packaged waste to the equipment decontamination unit for further cleaning and waste re-packaging. Once in equipment decontamination unit and cleaned, repackage waste in 2nd waste bag and seal as indicated above.
 - 3. Continuously clean excess water using wet wiping and HEPA vacuuming such that excess water build up on the floor and other containment surfaces does not occur and so that water does not leak or migrate outside of the work area.
 - 4. Use work procedures that result in 8-hour TWA and STEL airborne fiber counts less than the required limits established by OSHA and as described herein. If airborne fiber counts exceed this level immediately mist the area with amended water to lower fiber counts and revise work practices and engineering controls to maintain level within the required limits.
- D. Other Safety: As applicable, comply with all appropriate safety procedures during Work in accordance with industry standards and all applicable OSHA regulations including but not limited to: confined space work safety procedures in accordance with 29CFR Part 1910.146; proper personal protective equipment; worker safety training and written programs per current OSHA requirements; fall protection; lockout tag out; and take precautions to avoid burns and heat stress when working in areas of hot equipment and excessive heat as applicable.
- E. Sheet Flooring (Linoleum), Floor Tile and Mastics:
 - 1. Ensure ACM, carpet and associated materials remains adequately wetted. Remove carpet covering ACM, as applicable, within negative pressure enclosure. Carpet that has been in contact with ACM may be disposed of as general construction waste as long as no ACM or suspect debris is attached to carpet. Carpet that has ACM or suspect debris adhered to it shall be packaged and disposed of as asbestos waste. The ACM will be removed by hand scrapers and will not be allowed to dry out during removal and packaging. Do not render the materials friable and use care not to break ACM into small fragments during removal. Friable removal requires full containment barriers on all wall, floor, and ceiling surfaces. Mechanical or bead blasting methods are prohibited unless specifically approved in writing by Owner and Owner's IH Consultant. As removed, the ACM will be simultaneously packed while still wet into corrugated boxes or burlap bags and then sealed shut. The boxes/bags will then be sealed and placed into proper disposal bags. The necks of the disposal bags will be twisted, bent over and sealed with minimum three wraps of duct tape. Caution will be used to protect the bags and wrapping from tears and rips due to sharp edges.

- 2. Coordinate with Owner as necessary to assure compatibility with replacement materials prior to installation of solvents and coordinate special cleaning efforts with Owner for replacement issues in accordance with manufacturer's guidelines and flooring industry standards. Do not use solvents on any wood or other porous substrates. For wood substrate with ACM mastic, remove substrate layer that has mastic applied to it. Fully remove the wood substrate layer in contact with mastic and associated debris using wet methods, brushes, and HEPA vacuums. Do not use solvents on wood substrate. Do not leave any sharp protrusions, not limited to nails and screws in the floor. Provide temporary floor work surface as needed to ensure safety. Do not allow solvent to leak out of the work area or seep into floor or wall cracks, and take precautions to prevent solvent from entering cracks and/or crevices in the concrete and wall/floor joints. All waste will be packaged into appropriate waste containers. Residue on the floor will be removed with stiff-bristle-nylon hand brush. This work will be repeated until all visible debris has been removed from substrate. In areas with solvent use, as requested by the Owner, leave adequate air filtration and pressure differential systems in continuous operation for at least 24 hours after the air clearance criteria has been met to allow for ventilation of odors.
- 3. As applicable and possible, provide adequate inspection of the building spaces below areas of floor removal to detect, prevent and correct damage from liquids that escape the work area. Adequately wash all floor substrates and other building surfaces following abatement and clearance testing using an appropriate cleaner and water as needed to clean residual film and minimize residual odor. Do not damage remaining finishes and substrates and do not use excessive water. Package waste as asbestos waste.
- F. Door, Window and Building Caulking Material
 - 1. Conduct work within exterior OSHA regulated Work areas. Drop cloths of 6-mil polyethylene sheeting will be placed on ground below each work area and extending out sufficiently to protect the ground from possible debris. The drop cloths and any debris generated will be disposed of as asbestos waste at the end of each work shift and following the work. Install critical barriers over windows, doors and other openings in the building. Ensure ACM remains adequately wetted. Remove entire window casing units intact without damaging caulk, package, and dispose of as ACM waste. Install flooring and ground area drop cloths and use adequate wetting. Use hand tools and HEPA vacuums to scrape the caulking from the substrate. Use care to prevent the material from becoming friable. Clean all caulk material that may be encountered during window or door removal from the building substrate. Coordinate with the Owner for safety and building security for any areas that have entire window and/or door units removed.
 - 2. The asbestos contractor will conduct necessary inspections to ensure safe working conditions and install necessary supports, engineering controls and fall protection to allow for the safe removal of the ACM. Employee and/or general contractor operations in the surrounding areas will also be restricted as deemed necessary by the site supervisor/OSHA competent person.
 - 3. Coordinate with Owner and other contractors at the site as necessary for safety and building security for any areas that have entire window units removed in accordance with Contract Documents. The IH Consultant may be providing representative perimeter area air monitoring during exterior ACM removal work. The acceptable perimeter air monitoring result is 0.010 f/cc.

3.4 INITIAL CLEAN-UP WORK

A. Once gross removal is completed, clean all visible debris on the substrate and containment barriers using HEPA vacuums, scrub brushes, and wet-wiping. Do not allow materials to dry out. As material is removed and clean-up is completed, simultaneously pack wetted material into proper waste

disposal bags or package as noted above. For waste bags, twist the neck of the bags, bend the neck over, and seal with a minimum of three wraps of duct tape. Clean the outside of the bags with wet wiping and HEPA vacuum and move to the wash down station in the Equipment Decontamination Unit. Once washed clean, place the clean disposal bags into a second asbestos disposal bag and seal the bag in the same manner as the first. Bags will then be transported from the work area to the asbestos waste dumpster. Note: Waste dumpster must remain labeled and locked at all times when loading is complete or idle.

B. Label waste dumpsters in accordance with 29 CFR 1910.145:

Legend:

DANGER ASBESTOS DUST HAZARD CANCER & LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY

C. Change all filters on the pressure differential systems and properly dispose of as asbestos waste. Maintain adequate filtration and pressure differential during all filter changes.

3.5 PROJECT DECONTAMINATION

- A. Work of This Section includes the decontamination of air and surfaces in the Work Area which has been, or may have been, contaminated by the elevated airborne asbestos fiber levels generated during abatement activities, or which may previously have had elevated fiber levels due to ACM in the space.
 - 1. First Cleaning
 - a) Carry out a first cleaning of all surfaces of the work area including items of remaining sheeting, tools, scaffolding and/or staging by use of damp- or wet-cleaning and mopping, and HEPA vacuuming. Do not perform dry dusting or dry sweeping. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible debris from the substrate and other work area surfaces.
 - b) At the completion of the above cleaning Contractor Supervisor shall visually inspect all work area surfaces. Re-clean if any dust, debris, etc. is found. Inspect the area and if any debris or dust is found, repeat the cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced air equipment (important: forced air sweeping to be used only in full containment work areas).
 - c) Remove and replace all negative air unit pre-filters, dispose of used filters as asbestos waste.
 - 2. Second and Third Cleaning
 - a) At the completion of the first cleaning and Contractor inspection, carry out a second cleaning of all surfaces in the work area in the same manner as the first cleaning. For containments with multiple layers of polyethylene sheeting on floors, remove top layers of sheeting on the floor leaving one layer of the primary barrier remaining. Clean newly exposed areas as outlined above and dispose of removed sheeting as asbestos waste.

b) Carry out a third cleaning of all surfaces in the same manner as the first cleaning.
Change filters on pressure differential systems and properly dispose of as asbestos waste.
Allow for sufficient settling period prior to clearance testing. Complete additional cleaning as required and until no visible dust or debris is present.

- B. Visual Inspection: After completion of above cleaning and Contractor's own visual inspection, The IH Consultant shall perform a visual inspection for debris from any sources, residue on surfaces, dust or other matter in the Work Area to confirm the Contractor's inspection findings.
 - 1. For full containment work areas, during visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent).
 - 2. IH Consultant Visual inspection is complete when the area is visually clean, and no debris, residue, dust or other material is found. If any debris, residue, dust or other matter is found repeat Contractor cleaning and the IH Consultant Visual Inspection.
 - 3. Encapsulation of substrate: After successful final visual inspection, perform encapsulation of substrate as approved by Owner using suitable encapsulant material. Coordinate with Owner to ensure compatibility with replacement materials and fire retardant ratings for the surfaces to be encapsulated. Do not allow overspray to damage other surfaces, materials and equipment in the work area and do not allow overspray and build up or pooling of encapsulant.
- C. Clearance Testing: Air clearance sampling will be conducted by the IH Consultant. See Work Area Clearance section. Air clearance testing will not be completed until the work area passes visual inspection, has had adequate air changes, and sufficient time for surfaces to adequately dry.
- D. Removal of Work Area Isolation: Complete only after the work area clearance sections have been met and verified by the IH Consultant. Remove all Primary Barrier sheeting and equipment decontamination unit(s), leaving only: critical barriers, personnel decontamination unit, and operational pressure differential/air filtration systems. Properly dispose of sheeting as asbestoswaste. Use care to prevent damage to building surfaces and materials during teardown. All damages to surfaces and materials shall be repaired by Contractor unless otherwise noted and agreed to in writing by Owner.
 - Re-inspect all work area surfaces and adjacent areas for any dust and debris that may have originated from the work. Clean all surfaces using HEPA-vacuums and wet-wiping as required and until all surfaces are clean of visible debris. Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.
 - 2. Remove personnel decontamination unit. Remove the critical barriers and properly dispose of as asbestos-waste. Clean all surfaces using HEPA-vacuums and wet-wiping as required and until all surfaces are clean of visible debris.
- E. Final Cleaning: This cleaning is now being applied to existing room conditions. Take care to avoid watermarks or other damages. Wet-wipe and HEPA vacuum surfaces in the work area until clean and free from dust and debris. Complete final cleaning in accordance with the project closeout requirements. Accompanied by Owner, Contractor Site Supervisor shall complete a final postabatement inspection of all surfaces and re-clean and conduct repairs as necessary.

3.6 WORK AREA CLEARANCE

A. Contractor Release Criteria: The Work Area shall be considered cleared when the Work Area meets the final visual inspection criteria described in the project decontamination section and airborne fiber structure concentrations have been reduced to the level specified below and pursuant to applicable

State and federal asbestos regulations. Contractor must provide at least 48 hours advance notice to the IH Consultant for any clearance testing or other inspections required.

- B. Clearance Air Monitoring: Air clearance samples will be collected by the IH Consultant. In full containment areas air clearance sampling will be conducted using aggressive sampling techniques in accordance with state and federal regulations.
- C. Analytical Method: The number and volume of air samples taken and analytical methods used by the IH Consultant based on conditions of work and the various State and federal requirements. Phase Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) may be used for analysis of clearance samples collected to confirm completion of abatement of ACM in accordance with applicable State and federal regulations. Other analytical methods may also be used as determined by IH Consultant based on conditions of the work and other factors.
- D. PCM Air Clearance Testing: Decontamination of Work Areas requiring PCM air clearance testing only is complete when every Work Area clearance sample collected has total fiber concentrations below the 0.010 f/cc. If any sample does not meet the clearance criteria, the decontamination is incomplete and Contractor shall repeat final cleaning. The Contractor shall be responsible for all costs for each subsequent and additional round of testing and analysis required until the clearance criteria is met.

3.7 DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIAL

- A. General: Asbestos-containing waste materials and debris which is packaged in accordance with the provisions of this Specification may be disposed of at designated sanitary landfills when certain precautions are taken not limited to: notice to appropriate EPA Regional Offices and notice and permit from appropriate State and local agencies are completed. Waste disposal site(s) must be properly licensed, permitted, and qualified to accept and handle Asbestos waste in accordance with all applicable local, State, and federal codes and regulations.
- B. Disposal: Comply with the following sections during all phases of this work: worker protection requirements and respiratory protection requirements. All waste is to be hauled by a waste hauler with all required licenses and permits from all state and local authority with jurisdiction.
 - 1. Carefully load all containerized asbestos-containing waste material on sealed and lined trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the materials.
 - 2. All ACM and asbestos materials removed are to be properly containerized in one of the following: (1) Two 6 mil disposal bags, or (2) Two 6 mil disposal bags and a fiberboard drum, or (3) equivalent method as approved by Owner and State. Do not store disposal bagged material outside of the work area. Take bags or drums from the work area directly to a sealed truck or dumpster. Glove bags shall not be used as waste disposal bags.
 - 3. Owner will provide a designated location for placement of proper waste dumpster. Line waste dumpster with a minimum of 2 layers of 6 mil polyethylene sheeting and such that a minimum total of 20 mils of lining exists (including waste bags). Waste dumpster(s) will not be allowed to remain at the job site for longer than 72 hours upon completion of each phase (work area) of work by the Contractor. Do not transport disposal bagged materials on open trucks. During loading and unloading, properly demarcate and label dumpster on all 4 sides. Dumpster shall be sealed, labeled and locked during all non-loading periods.

- 4. In accordance with NESHAPs and State regulations, advise the landfill operator or processor in advance of transport, of the quantity of material to be delivered. At a disposal site, sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, leave in truck and clean entire truck and contents using procedures set forth herein. Retain receipts from landfill or processor for materials disposed of. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Owner and IH Consultant.
- 5. Provide copy of waste shipment record (complete to date) to Owner and IH Consultant prior to removing waste from the site. Provide final copy of completed waste shipment record to Owner and IH Consultant within 25 days of removing waste from the site.

3.9 ASBESTOS PROJECT CLOSEOUT

- A. Contractor shall achieve Substantial Completion and then Final Completion as indicated below prior to requesting final payment.
- B. General cleaning during and after construction is required as needed to maintain general housekeeping and as otherwise required herein. Complete all final, general house-keeping and cleaning in the work areas in accordance with 29 CFR Part 1910 and 29 CFR Part 1926, as applicable. Remove temporary protection and facilities installed for protection or security of the work during construction. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.
- C. Conduct all other related work, non-asbestos work, and general construction activity in accordance with the Contract Documents and Owner's written request.
- D. Substantial Completion consists of the following: (1) all work area abatement, decontamination and related site work is complete; (2) interim submittal requirements are submitted; (3) final visual inspection and air clearance requirements have been met in each work area; (4) removal of containment barriers and Contractor equipment is complete; (5) all general cleaning has been performed as indicated herein; (6) other work tasks and administrative requirements have been completed in accordance with the contract documents and specification; and (7) post-abatement site inspection and review with Owner has been performed.
- E. Final Completion consists of the following: (1) Substantial Completion met; (2) completion of all Closeout Submittal requirements; and (3) complete, to Owner's satisfaction, any remaining punchlist items identified during the post-abatement site inspection with Owner.

END OF SECTION

SECTION 06 41 16 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-clad architectural cabinets.
 - 2. Cabinet hardware and accessories.
 - 3. Miscellaneous materials.

1.2 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.
- 1.3 ACTION SUBMITTALS
 - A. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show large-scale details.
 - 3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 4. Show locations and sizes of cutouts and holes for items installed in plasticlaminate architectural cabinets.
 - B. Samples: For each exposed product and for each color and texture specified, in manufacturer's or manufacturer's standard size.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For manufacturer and Installer.
- 1.5 QUALITY ASSURANCE
 - A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have record of successful in-service performance.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS 06 41 16 - Page 1 of 6

1.7 FIELD CONDITIONS

- A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

- A. Architectural Woodwork Standards Grade: Custom .
- B. Type of Construction: Frameless .
- C. Door and Drawer-Front Style: Flush overlay.
 - 1. Reveal Dimension: 1/2 inch .
- D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
 - 1. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide Formica Corporation; HPG Laminate or comparable product by one of the following:
 - a. Laminart LLC.
 - b. Wilsonart LLC.
- E. Class C Fire-Rated Laminate Cladding for Exposed Surfaces:
 - 1. Horizontal Surfaces: HGP LaminateGrade HGS .
 - 2. Vertical Surfaces: HPG LaminateGrade HGS .
 - 3. Edges: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
 - 4. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels .

- F. Materials for Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS .
 - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
 - b. Edges of Thermally Fused Laminate Panel Shelves: PVC or polyester edge banding.
 - c. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate.
 - 2. Drawer Sides and Backs: Hardwood plywood .
 - 3. Drawer Bottoms: Hardwood plywood .
- G. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- H. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As indicated by Interior Finish Materials Legend.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Particleboard (Medium Density): Class C Fire-Rated ANSI A208.1, Grade M-2.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00 "Door Hardware."
 - 1. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide Knape & Vogt Manufacturing Company; or comparable product by one of the following:
 - a. Accuride International Inc.
 - b. Julius Blum & Co., Inc.
 - c. Knape & Vogt Manufacturing Company.

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- B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 100 degrees of opening.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- D. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.
- E. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.
- F. Drawer Slides: ANSI/BHMA A156.9.
 - 1. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount .
 - a. Type: Full extension.
 - b. Material: Epoxy-coated polymer slides.
 - c. Motion Feature: Soft close dampener .
 - 2. General-purpose drawers more than 3 inches high, but not more than 6 inches high and not more than 24 inches wide, provide 75 lb load capacity.
- G. Cabinet Door Locks: ANSI/BHMA A156.11, E07121.
- H. Drawer Locks: ANSI/BHMA A156.11, E07041.
- I. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.
- J. Tempered Float Glass for Cabinet Doors: ASTM C1048, Kind FT, Condition A, Type I, Class 1 (clear), Quality-Q3, 6 mm thick unless otherwise indicated.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
 - 1. Satin Stainless Steel: ANSI/BHMA 630.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber Fireretardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Adhesive for Bonding Plastic Laminate: Resorcinol.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.
- 2.5 FABRICATION
 - A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

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- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times architectural cabinet fabrication will be complete.
 - 2. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
- PART 3 EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.
- 3.2 INSTALLATION
 - A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.
 - B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
 - C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.
 - D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish .

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 06 41 16



SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Mildew-resistant joint sealants.
 - 4. Latex joint sealants.
- 1.2 ACTION SUBMITTALS
 - A. Product Data:
 - 1. Joint-sealants.
 - 2. Joint sealant backing materials.
 - B. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Test and Evaluation Reports:
 - 1. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

1.4 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, singlecomponent, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. The Dow Chemical Company.
 - c. Tremco Incorporated.

2.3 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. Sherwin-Williams Company (The).
 - c. Tremco Incorporated.

2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

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

2.5 MISCELLANEOUS MATERIALS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

 a. Concrete.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.
 - 4. Provide flush joint profile at in accordance with Figure 8B in ASTM C1193.
 - 5. Provide recessed joint configuration of recess depth and at in accordance with Figure 8C in ASTM C1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Interior joints in vertical surfaces and horizontal nontraffic surfaces:
 - 1. Joint Locations:
 - a. Vertical joints on exposed surfaces of unit masonry walls and partitions.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone .
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .
- B. Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement:
 - 1. Joint Locations:
 - a. Perimeter joints between interior wall surfaces and frames of interior doors windows .
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Acrylic latex .
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .
- C. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces:
 - 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Interior standard steel doors and frames.
- B. Related Requirements:
 - 1. Section 08 11 19 "Stainless-Steel Doors and Frames" for hollow-metal doors and frames manufactured from stainless steel.
 - 2. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.
- 1.2 DEFINITIONS
 - A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.
- 1.3 COORDINATION
 - A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- 1.4 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, and finishes.
 - B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
 - 8. Details of moldings, removable stops, and glazing.

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- C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.
- 1.5 INFORMATIONAL SUBMITTALS
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to factory-finished units.
 - B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
 - C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - 1. Ceco Door; ASSA ABLOY.
 - 2. Curries Company; ASSA ABLOY.
 - 3. DE LA FONTAINE.
 - 4. Steelcraft; an Allegion brand.
- 2.2 PERFORMANCE REQUIREMENTS
- 2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES
 - A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
 - B. Standard-Duty Doors and Frames: ANSI/SDI A250.8, Level 1; ANSI/SDI A250.4, Level C. .
 - 1. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches .
 - c. Edge Construction: Model 1, Full Flush .
 - d. Edge Bevel: Provide manufacturer's standard beveled or square edges.
 - e. Core: Manufacturer's standard .
 - 2. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.042 inch.

- b. Construction: Knocked down .
- 3. Exposed Finish: Prime .
- 2.4 HOLLOW-METAL PANELS
 - A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.
- 2.5 FRAME ANCHORS
 - A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
 - 3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
 - B. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.
 - C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.
- 2.6 MATERIALS
 - A. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
 - B. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
 - C. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
 - D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
 - E. Glazing: Comply with requirements in Section 08 80 00 "Glazing."
- 2.7 FABRICATION
 - A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide

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alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

- 1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
- 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
- 3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- B. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted hairline joints.
 - 1. Provide stops and moldings flush with face of door, and with beveled stops unless otherwise indicated.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
 - 5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

3.2 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: 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 without damage to completed Work.
 - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
 - b. Install frames with removable stops located on secure side of opening.
 - 2. Floor Anchors: Secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Installation Tolerances: Adjust hollow-metal frames 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.
- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 - 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
- D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.3 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- C. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES 08 11 13 - Page 5 of 5

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Access doors and frames.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.
- PART 2 PRODUCTS

2.1 ACCESS DOORS AND FRAMES

- A. Flush Access Doors with Exposed Flanges :
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Babcock-Davis.
 - b. Cendrex Inc.
 - c. Milcor; a division of Hart & Cooley, Inc.
 - d. Nystrom.
 - 2. Description: Face of door flush with frame, with exposed flange and concealed hinge.
 - 3. Optional Features: Removable doors .
 - 4. Locations: Wall .
 - 5. Uncoated Steel Sheet for Door: Nominal 0.060 inch , 16 gage , factory primed .
 - 6. Frame Material: Same material, thickness, and finish as door .
 - 7. Latch and Lock: Cam latch, screwdriver operated .

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

ACCESS DOORS AND FRAMES 08 31 13 - Page 1 of 2

2.3 FABRICATION

- A. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

2.4 FINISHES

- A. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 08 31 13



SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Mechanical door hardware for the following:
 - a. Swinging doors.
 - 2. Cylinders for door hardware specified in other Sections.
 - B. Related Requirements:
 - 1. Section 08 11 13 "Hollow Metal Doors and Frames" .

1.2 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory 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.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- 1.3 PREINSTALLATION MEETINGS
 - A. Keying Conference: Conduct conference at Project site .
 - 1. Conference participants shall include Installer's Architectural Hardware Consultant and Owner's security consultant.
 - 2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 - a. Flow of traffic and degree of security required.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include

schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

- 1.5 INFORMATIONAL SUBMITTALS
- 1.6 CLOSEOUT SUBMITTALS
 - A. Maintenance Data: For each type of door hardware to include in maintenance manuals.
 - B. Schedules: Final door hardware and keying schedule.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
 - B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 - C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
 - D. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Source Limitations: Obtain each type of door hardware from single manufacturer.
- 2.2 PERFORMANCE REQUIREMENTS
 - A. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
 - B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the USDOJ's "2010 ADA Standards for Accessible Design" ICC A117.1 and .
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
 - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
 - 4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
 - 5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
 - c. STANLEY; dormakaba USA, Inc.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
 - 1. Bored Locks: Minimum 1/2-inch latchbolt throw.
 - 2. Deadbolts: Minimum 1-inch bolt throw.
- C. Lock Trim:
 - 1. Description: Similar to Schlage Rhodes (RHO) Trim .
 - 2. Levers: Wrought .
 - 3. Escutcheons (Roses): Wrought .
 - 4. Dummy Trim: Match lever lock trim and escutcheons.
- D. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- E. Bored Locks: BHMA A156.2; Grade 1 ; Series 4000.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, undefined:
 - a. Allegion plc.
 - b. BEST Access Solutions, Inc.; dormakaba USA Inc.
 - c. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
 - d. SARGENT Manufacturing Company; ASSA ABLOY.

2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.
- B. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

1. Core Type: Interchangeable .

2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.
 - 1. Existing System:
 - a. Master key or grand master key locks to Owner's existing system.
- B. Keys: Brass.
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."
- 2.7 OPERATING TRIM
 - A. Operating Trim: BHMA A156.6; stainless steel unless otherwise indicated.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. Hager Companies.
 - c. Rockwood Manufacturing Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.

2.8 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factorysized closers, adjustable to meet field conditions and requirements for opening force.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
 - c. Hager Companies.
 - d. SARGENT Manufacturing Company; ASSA ABLOY.

2.9 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. Hager Companies.

- c. Rockwood Manufacturing Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
- 2.10 OVERHEAD STOPS AND HOLDERS
 - A. Overhead Stops and Holders: BHMA A156.8.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Allegion plc.
 - b. Hager Companies.
 - c. SARGENT Manufacturing Company; ASSA ABLOY.

2.11 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. Hager Companies.
 - b. National Guard Products, Inc.
 - c. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
 - d. Zero International; Allegion plc.

2.12 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.
 - 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.

3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.13 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. 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 of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames in accordance with ANSI/SDI A250.6.

3.3 INSTALLATION

- A. Mounting Heights: 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.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surfacemounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."
- E. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- F. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 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. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

END OF SECTION 08 71 00

DOOR HARDWARE 08 71 00 - Page 7 of 7

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Glass products.
 - 2. Miscellaneous glazing materials.

1.2 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.
- 1.4 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- 2.3 GLASS PRODUCTS, GENERAL
 - A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. NGA Publications: "Glazing Manual."
 - B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
 - C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm .
 - D. Strength: Where annealed float glass is indicated, provide annealed float glass, heatstrengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

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2.4 GLASS PRODUCTS

- A. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- 2.5 GLAZING TAPES
 - A. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.6 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
 - 1. EPDM with Shore A durometer hardness of 85, plus or minus 5.
 - 2. Type recommended in writing by sealant or glass manufacturer.

2.7 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

- 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
- 2. Presence and functioning of weep systems.
- 3. Minimum required face and edge clearances.
- 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
 - A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
 - B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.
- 3.3 GLAZING, GENERAL
 - A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
 - C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
 - D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
 - E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - F. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.
- 3.4 TAPE GLAZING
 - A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
 - B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
 - C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
 - D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
 - E. Do not remove release paper from tape until right before each glazing unit is installed.
 - F. Apply heel bead of elastomeric sealant.
 - G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
 - H. Apply cap bead of elastomeric sealant over exposed edge of tape.
- 3.5 CLEANING AND PROTECTION
 - A. Immediately after installation, remove nonpermanent labels and clean surfaces.
 - B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass

manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00



SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior partitions.
 - B. Related Requirements:
 - 1. Section 05 40 00 "Cold-Formed Metal Framing" for exterior and interior loadbearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.
- 1.2 INFORMATIONAL SUBMITTALS
 - A. Product Certificates: For each type of code-compliance certification for studs and tracks.
 - B. Evaluation Reports: For embossed, high-strength steel studs and tracks firestop tracks post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
- 1.3 QUALITY ASSURANCE
 - A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association the Steel Framing Industry Association the Steel Stud Manufacturers Association or the Supreme Steel Framing System Association.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Notify manufacturer of damaged materials received prior to installation.
 - B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
 - A. Horizontal Deflection: For composite wall assemblies, limited to 1/240 typical, and1/360(for partitions receiving tile finishes) of the wall height based on horizontal loading of5 lbf/sq. ft. .

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- B. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing Nonstructural Members," unless otherwise indicated.
- C. Design Loads: As indicated on Architectural Drawings or 5 lbf/sq. ft. minimum as required by the IBC.
- D. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads with a maximum deflection as indicated on drawings .
- 2.2 FRAMING SYSTEMS
 - A. Framing Members, General: Comply with AISI S220 for conditions indicated.
 - 1. Steel Sheet Components: Comply with AISI S220 requirements for metal unless otherwise indicated
 - 2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
 - a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
 - B. Studs and Track: AISI S220.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, undefined:
 - a. ClarkDietrich.
 - b. Marino\WARE.
 - c. Phillips Manufacturing Co.
 - C. Slip-Type Head Joints: Where indicated, provide the following:
 - 1. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. <u>Manufacturers:</u> Subject to compliance with requirements, undefined:
 - 1) ClarkDietrich.
 - 2) Marino\WARE.
 - 3) Steel Construction Systems; Stone Group of Companies.
 - D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Steel Thickness: 0.0329 inch .
 - E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 1-1/2 inches .
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.

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2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollowmetal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
- 3.3 INSTALLATION, GENERAL
 - A. Installation Standard: ASTM C754.
 - 1. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C1063 that apply to framing installation.
 - 2. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
 - B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
 - C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
 - D. Install bracing at terminations in assemblies.
 - E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- 3.4 INSTALLING FRAMED ASSEMBLIES
 - A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 09 22 16

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SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Interior gypsum board.
 - B. Related Requirements:
 - 1. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For the following:
 - 1.
 - 2. Interior trim.
 - 3. Joint treatment materials.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.
- 1.4 FIELD CONDITIONS
 - A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
 - B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
 - C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

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

2.2 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. Georgia-Pacific Gypsum LLC.
 - c. USG Corporation.
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered .
- B. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed; SAINT-GOBAIN.
 - b. Georgia-Pacific Gypsum LLC.
 - c. USG Corporation.
 - 2. Core: 5/8 inch , Type X.
 - 3. Long Edges: Tapered.
 - 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc .
 - 2. Shapes:
 - a. Cornerbead.
- 2.4 JOINT TREATMENT MATERIALS
 - A. General: Comply with ASTM C475/C475M.
 - B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints , rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
- 2.5 AUXILIARY MATERIALS
 - A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
 - B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
 - C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL
 - A. Comply with ASTM C840.
 - B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
 - C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
 - D. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: Vertical surfaces unless otherwise indicated .
- B. Single-Layer Application:
 - 1. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 - 2. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.

3.5 FINISHING OF GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

3.6 PROTECTION

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

END OF SECTION 09 29 00

SECTION 09 51 23 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Acoustical tiles for interior ceilings.
 - 2. Exposed Tee, direct-hung, suspension systems.
 - B. Related Requirements:
 - 1. Section 09 51 13 "Acoustical Panel Ceilings" for ceilings consisting of mineralbase and glass-fiber-base acoustical panels and exposed suspension systems.
 - 2. Section 09 51 33 "Acoustical Metal Pan Ceilings" for ceilings consisting of metalpan units with exposed and concealed suspension systems.
- 1.3 PREINSTALLATION MEETINGS
- 1.4 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.
 - C. Samples for Initial Selection: For components with factory-applied finishes.
 - D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Acoustical Tiles: Set of full-size Samples of each type, color, pattern, and texture.
 - 2. Concealed Suspension-System Members: 6-inch- long Sample of each type.
- 1.5 INFORMATIONAL SUBMITTALS
- 1.6 CLOSEOUT SUBMITTALS
 - A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size tiles equal to 5 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

A. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Source Limitations:
 - 1. Suspended Acoustical Tile Ceilings: Obtain each type of acoustical ceiling tile and its suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- 2.3 ACOUSTICAL TILES (C1)
 - A. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. CertainTeed; SAINT-GOBAIN.
 - 2. USG Corporation.
 - B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
 - C. Color: As indicated on Drawings .
 - D. Light Reflectance (LR): Not less than 0.80.
 - E. Ceiling Attenuation Class (CAC): Not less than 35.
 - F. Noise Reduction Coefficient (NRC): Not less than 0.50.
 - G. Edge/Joint Detail: Beveled, kerfed, and rabbeted; tongue and grooved; or butt .
 - H. Thickness: 5/8 inch .
 - I. Modular Size: 24 by 24 inches .
 - J. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.
- 2.4 METAL SUSPENSION SYSTEM (C1)
 - A. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide Armstrong Ceiling & Wall Solutions; Prelude 15/16" Exposed Tee or comparable product by one of the following:
 - 1. USG Corporation.
 - 2. Armstrong Ceiling & Wall Solutions.
 - B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, fully concealed, metal suspension system and accessories of type, structural classification, and finish indicated that complies with applicable requirements in ASTM C 635/C 635M.

2.5 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion Postinstalled bonded anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B 633, Class SC 1 (mild) service condition.
 - c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
 - 3. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.
- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inchthick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

- A. Install suspended acoustical tile ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 6. Do not attach hangers to steel deck tabs.
 - 7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - 9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- E. Install acoustical tiles in coordination with suspension system. Place splines or suspension-system flanges into kerfed edges of tiles so tile-to-tile joints are interlocked.
 - 1. Fit adjoining tiles to form flush, tight joints. Scribe and cut tiles for accurate fit at borders and around penetrations through ceiling.

3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet , non-cumulative.
- 3.5 ADJUSTING
 - A. Clean exposed surfaces of acoustical tile ceilings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
 - B. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 23



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SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Resilient Wall Base.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Samples for Initial Selection: For each type of product indicated.
 - C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
 - D. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.
- 1.4 MAINTENANCE MATERIAL SUBMITTALS
 - A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

A. Installation Qualification: Contractors for floor covering installation should be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is "qualified" if trained, or a certified by Tarkett or a certified INSTALL (International Standards & Training Alliance) resilient floor covering installer.

RESILIENT BASE AND ACCESSORIES 09 65 13 - Page 1 of 5

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F , in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Maintain the ambient relative humidity between 40% and 60% during installation.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.
- D. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
 - A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - B. Critical Radiant Flux Classification: Class II, not less than 0.22 W/sq. cm.
 - C. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- 2.2 Resilient Wall BaseB1
 - A. <u>Basis-of-Design Product</u>: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Flexco Corporation.
 - 2. Roppe Corporation.
 - B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:

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- a. Style B, Cove: Provide in areas with resilient floor coverings .
- C. Thickness: 0.125 inch.
- D. Height: 4 inches .
- E. Lengths: Coils in manufacturer's standard length .
- F. Outside Corners: Job formed or preformed.
- G. Inside Corners: Job formed or preformed.
- H. Colors: As indicated on finish Legend .
- I. Test Data:
 - 1. Flexibility, ASTM F137: Passes 1/4 inch mandrel
 - 2. Resistance to light, ASTM F1515: Passes
 - 3. Resistance to chemicals, ASTM F925: Passes
 - 4. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm2 or greater, Class 1.
- 2.3 INSTALLATION MATERIALS
 - A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cementbased or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
 - B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- PART 3 EXECUTION
- 3.1 EXAMINATION
 - A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
 - B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.
- 3.2 PREPARATION
 - A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter corners to minimize open joints.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.

- 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES 09 65 13 - Page 5 of 5

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SECTION 09 65 16 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Resilient Honogeneous Vinyl Sheet Flooring
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Samples for Initial Selection: For each type of product indicated.
 - C. Samples for Verification: For each type of resilient sheet flooring, in manufacturer's standard size, but not less than 6-by-9-inch sections of each color, texture, and pattern required.
 - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.
 - D. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.
 - E. Product Schedule: For resilient sheet flooring. Use same designations indicated on Drawings.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For Installer.
- 1.5 CLOSEOUT SUBMITTALS
 - A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Resilient Sheet Flooring: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.
- 1.7 QUALITY ASSURANCE
 - A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.
- 1.8 DELIVERY, STORAGE, AND HANDLING
 - A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F. Store rolls upright.
- 1.9 FIELD CONDITIONS
 - A. Install resilient products after other finishing operations, including painting, have been completed.
 - B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F , in spaces to receive resilient sheet flooring during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
 - 4. Maintain the ambient relative humidity between 40% and 60% during installation
 - C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.
 - D. Close spaces to traffic during resilient sheet flooring installation.
 - E. Close spaces to traffic for 48 hours after resilient sheet flooring installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class II, not less than 0.22 W/sq. cm.
- 2.2 UNBACKED VINYL SHEET FLOORING R1, R2, R3, R4
 - A. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide product indicated on Drawings, refer to Interior Finish Materials Legend or comparable product by one of the following:
 - 1. Armstrong Flooring, Inc.
 - 2. Mannington Mills, Inc.
 - 3. Roppe Corporation.
 - B. Product Standard: ASTM F 1913, Standard Specification for Vinyl Sheet Flooring Covering Without Backing.
 - C. Thickness: 0.080 inch .
 - D. Sheet Width: 6 ft. 6 inches .
 - E. Seamless-Installation Method: Heat welded .
 - F. Colors and Patterns: See Interior Finish Materials Legend .
 - G. Test data:
 - 1. Flexibilty (ASTM F137): Passes
 - 2. Chemical Resistance (ASTM F925): Passes
 - 3. Static Load Limit (ASTM F970): Passes 250 psi
 - 4. Resistance to Heat (ASTM F1514): $\Delta E \leq 8$
 - 5. Resistance to Light (ASTM F1515): $\Delta E \le 8$
 - 6. Residual Indentation (ASTM F1914): Passes
 - 7. Static Coefficient of Friction (ASTM D 2047): ≥ 0.5 SCOF
 - 8. Flamability (ASTM E648, Critical Radiant Flux): Class 1 (≥ 0.45 W/cm2)
 - 9. Limited Commercial Warranty: 10 years
- 2.3 INSTALLATION MATERIALS
 - A. Moisture Barrier Remedial Product, if needed.
 - B. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cementbased or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.

- C. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
 - 1. Methylene chloride and perchloroethylene shall not be intentionally added in paints, coatings, adhesives, or sealants.
 - 2. Do not use adhesives that contain urea formaldehyde.
- D. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Colors: As selected by Architect from manufacturer's full range to contrast with flooring .
- E. Integral-Flash-Cove-Base Accessories:
 - 1. Cove Strip: 1-inch radius provided or approved by resilient sheet flooring manufacturer.
 - 2. Cap Strip: Tapered vinyl cap provided or approved by resilient sheet flooring manufacturer.
 - 3. Corners: Metal inside and outside corners and end stops provided or approved by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Concrete floors must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
 - 2. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens,

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crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.

- 3. Perform moisture testing as recommended by manufacturer. Proceed with installation only after substrates have been tested and meet the minimum requirements from the manufacturer in accordance with ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride or ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- 4. A pH test for alkalinity must be conducted on the concrete floor prior to installation with results between 7 and 9. If the test results are not within the acceptable range, then installation must not proceed until the problem has been corrected.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.
- 3.3 RESILIENT SHEET FLOORING INSTALLATION
 - A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
 - B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
 - C. Lay out resilient sheet flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Avoid cross seams.
 - D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
 - E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
 - F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.

- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Seamless Installation:
 - 1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
- 3.4 CLEANING AND PROTECTION
 - A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
 - B. Perform the following operations immediately after completing resilient sheet flooring installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - a. No traffic for 24 hours after installation.
 - b. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
 - C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - D. Cover resilient sheet flooring until Substantial Completion.
 - E. A regular maintenance program must be started after the initial cleaning.

END OF SECTION 09 65 16

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SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Primers.
 - 2. Water-based finish coatings.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
 - B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

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



May-2013 See appendix for key

Acids											
Acetic acid	CH ₃ COOH	Conc.	2min	A0	B0	C0	D0	E0	F0	G0	
		> 98%	1 h	A0	B1	C0	D0	E0	F0	G0	
			24 h	A0	B2	C1	D0	E0	F1*	G0	
Chromic acid	H ₂ CrO ₄	40%	2min	A0	B0	C0	D0	E0	F0	G0	
			1 h	A5	B0	C0	D0	E0	F0	G0	
			24 h	A6	B0	C0	D0	E0	F0	G0	
Citric acid	$C_6H_8O_7$	50%	1 h	A0	B0	C0	D0	E0	F0	G0	
			24 h	A0	B0	C0	D0	E0	F0	G0	
Hydrochloric acid	HCl	Conc.	2min	A0	B1	C0	D0	E0	F0	G0	
		37%	1 h	A0	B1	C0	D0	E0	FO	G0	
			24 h	Al	B2	Cl	D0	EO	FO	G0	
Hydrofluoric acid	HF	40%	2min	A0	BO	C0	D0	E0	FO	G0	
			l h	A0	B0	CO	D0	E0	F0	G0	
DI 1 ' '1	II DO	C	24 h	AI	BI	<u>C0</u>	DI	EO	F1*	GU	
Phosphoric acid	H_3PO_4	Conc.	2min	A0	B0 D1	C0	D0	E0 E0	F0 E0	GO	
		~ 03%	1 II 24 h	A0 A 1			D0	E0 E0	ГU Е0	G0	
Dhoanhonio ooid		200/	24 II 24 h	AI	D2	<u>C0</u>	D0	E0 E0	F0 E0	<u>C0</u>	
Phosphoric acid	H_3PO_4	<u>38%0</u>	24 fi 1 h	AU	B0 D0	<u>C0</u>	D0	EU	FU E0	CO	
Lactic acid	$C_{3}\Pi_{6}O_{3}$	90%	1 II 24 h	A0	B0 B0		D0	E0 F0	F0 F0	G0	
Nitric acid	HNO	Conc	2-7 II 2min	Δ0	B1	<u>C0</u>	D0	E0	FO	GO	
	111003	65%	211111 1 h	A5	B1	C1	D0 D1	E0	FO	GO	
		0070	24 h	A6	B2	C2	D2	E2	F6	G0	
Nitric acid	HNO ₂	30%	2min	AO	B0	C0	D0	E0	FO	G0	
	moy	2070	1 h	A0	B0	C0	D0	E0	FO	G0	
			24 h	A5	B2	C1	D1	E0	FO	G0	
Oxalic acid	C ₂ H ₂ O ₄	10%	1 h	A0	B0	C0	D0	E0	F0	G0	
	• 2 2 • 4		24 h	A0	B0	C0	D0	EO	FO	G0	
Sulphuric acid	H_2SO_4	Conc.	2min	A5	B2	C0	D0	E0	F0	G0	
		98%	1 h	A5	B2	C1	D1	E1	F5	G0	H*
			24 h	A6	B2	C2	D2	E2	F6	G0	Н
Sulphuric acid	H_2SO_4	30%	1 h	A0	B0	C0	D0	E0	F0	G0	
			24 h	A0	B0	C0	D0	E0	F0	G0	
Organic solvents											
Acetone	C_3H_6O		2min	A0	BO	C0	D0	E0	FO	G0	
			l h	A0	B2	Cl	DI	E5	F0	G0	
A . •. •1	CH CH		24 h	A0	B2	C2	DI	E5	FO	GO	
Acetonitrile	CH ₃ CN		2min	A0	B0	C0	D0	E0	F0	G0	
			1 n 24 h	AU AO	BI	C0	D0	E0 E5	Γ1* Γ1*	GU	
	CCI		24 11	AU	D2		D0	EJ		<u>G0</u>	
Carbon tetracmonde	CCI_4		2mm 1 h	AU AO	BO		D0	E0 E0	FU FO	GO	
			24 h	A0	B0		D0	E0 E0	FO	G0	
Chloroform	CHCl		2 min	AO	B1	<u>C0</u>	D0	E0	F0	G0	
Chiorotonini	CITCIS		1 h	AO	B2	Cl	D1	E5	F1*	GO	
			24 h	A0	B2	C2	D1	E5	F5	GŨ	
Cyclohexane	C ₆ H ₁₂		2min	A0	B0	C0	D0	EO	F0	G0	
	0 12		1 h	A0	B0	C0	D0	E0	F0	G0	
			<u>2</u> 4 h	A0	B0	<u>C</u> 0	D0	E0	F0	<u>G</u> 0	
Cyclohexanone	C ₆ H ₁₀ O		2 min	A0	B0	C0	D0	E0	F0	G0	
			1 h	A0	B1	C2	D3	E5	F0	G0	H*
			24 h	A0	B2	C2	D4	E5	F5	G0	Н*
Dichloroethylene	$C_2H_2Cl_2$		2min	A0	BO	C0	D0	E0	F0	G0	
			1 h	A0	B0	C0	D0	E0	F1*	G0	
			24 h	A0	B1	C0	D0	E5	F1*	G0	
Methylene Chloride	CH_2Cl_2		2min	A0	B1	C1	D1	E0	F0	G0	
			1 h	A0	B2	C2	D2	E5	F0	G0	H*
			24 h	A0	B2	C2	D2	E5	FO	G0	H*
Ethanol	C_2H_5OH		l h	A0	B0	C0	D0	E0	F0	G0	
			24 h	A0	B3	C0	D0	E0	FU	G0	



May-2013 See appendix for key

Organic solvents, cont.											
Ethyl acetate	$C_4H_8O_2$		2min	A0	B0	C0	D0	E0	F0	G0	
			1 h	A0	B0	C1	D1	E0	F1*	G0	
			24 h	A0	B0	C1	D1	E5	F5	G0	
Ethylene glycol	$C_2H_6O_2$		24 h	A0	B0	C0	D0	E0	F0	G0	
Diethyl ether	$(C_{2}H_{5})_{2}O$		2min	A0	B0	C0	D0	E0	F0	G0	
5	(2 5)2		1 h	A0	B0	C0	D0	E0	F0	G0	
			24 h	A0	B0	C0	D0	E0	F0	G0	
n-Hexane	C ₆ H ₁₄		1 h	A0	B0	C0	D0	E0	F0	G0	
	0 11		24 h	A0	B0	C0	D0	E0	F0	G0	
Formaldehyde solution	CH ₂ O	37 %	24 h	A0	B0	C0	D0	E0	F0	G0	
Methanol	CH ₃ OH		1 h	A0	B0	C0	D0	E0	F0	G0	
	- 5-		24 h	A0	B3	C0	D0	EO	FO	G0	
Methyl ethyl ketone	C ₄ H ₈ O		2 min	A0	B0	C0	D0	E0	F0	G0	
	- 0		1 h	A0	B1	C1	D1	E5	F5	G0	
			24 h	A0	B1	C2	D2	E6	F5	G0	
Pet.ether (Ligroin)	CAS-nr:		1 h	A0	B0	C0	D0	E0	F0	G0	
80-110°C	8032-32-4		24 h	A0	B0	C0	D0	E0	F0	G0	
Tetrachloroethylene	C ₂ Cl ₄		2min	A0	B0	C0	D0	E0	F0	G0	
	- 2 - 7		1 h	A0	B0	C0	D0	E0	F0	G0	
			24 h	A0	B1	C0	D0	E5	F0	G0	
Toluene	C7Ho		2min	A0	B0	C0	D0	E0	F0	G0	
	- /8		1 h	A0	B1	CO	D1	EO	F1*	G0	
			24 h	A0	B1	C1	D1	E5	F2*	G0	
Trichlorethylene	C ₂ HCl ₂		2min	A0	B0	CO	D0	EO	F0	G0	
Themoreury tene	C ₂ men ₃		1 h	A0	B1	C0	D0	EO	F1*	G0	
			24 h	A0	B1	C1	D1	E5	F1*	G0	
White spirit	EG/EC/EF-nr:		2 min	A0	B0	<u>C0</u>	D0	E0	F0	G0	
ti inte spint	265-191-7		2 11111 1 h	AO	B0		D0	E0	FO	GÛ	
	205 171 7		24 h	AO	B0	C0	D0	E0	FO	G0	
Xylene	CoHuo		2 min	<u>A0</u>	B0	<u>C0</u>	D0	E0	FO	G0	
Aylene	081110		2 mm 1 h	AO	B0		D1	E0	FO	G0	
			24 h	AO	B0		D2	E5	F5	G0	
Alkali (Bases)			2111	110	DU	00	02	15	15	00	
Ammonia solution	NH	25%	1 h	A0	B0	C0	D0	F0	FO	G0	
1 minoma solution	1113	2370	24 h	AO	B0		D0	E0	FO	G0	
Calcium hydroxide	$C_{2}(OH)$	10%	1 h	<u>A0</u>	BO	<u>C0</u>	D0	E0	FO	G0	
		10/0	24 h	A0	B0		D0	E0	FO	G0	
Sodium hydroxide	NaOH	50%	1 h	<u>A0</u>	B0	<u>C0</u>	D0	E0	FO	G0	
Sourum nyuroxiuc	NaOII	5070	24 h	A0	B1		D0	E0	FO	GO	
Sodium hydroxide	NaOH	10%	1 h	<u>A0</u>	BO	<u>C0</u>	D0	E0	FO	G0	
Sourum nyuroxide	NaOII	10/0	2/1 h	A0	B3			EO	FO	GO	н
Salt solutions			27 11	110	D5	0	DU	LU	10	00	11
Ammonium	(NH_{2})	10%	1 h	40	B0	CO	D0	FO	ΕÛ	G0	
carbonate	(1114)2003	1070	24 h	A0	B0		D0	E0	FO	G0	
Ammonium iron	$\mathbf{NH} = \mathbf{Fo}(\mathbf{SO})$	10%	1 h	10	B0	<u>C0</u>	D0	EO	FO	G0	
(III) sulphate	11141 (304)2	10/0	24 h	A0	B0		D0	E0 F0	FO	GO	
Calcium Chloride	CaCl	Satturated	$\frac{24 \text{ h}}{24 \text{ h}}$	10	B0	<u>C0</u>	D0	EO	FO	G0	
Cabaltous chloride		10%	$\frac{2 + 11}{24 h}$	<u>A0</u>	B0	<u>C0</u>	D0	EO	FO	G0	
Copper (II) sulphate		10%	1 h	<u>A0</u>	B0	<u>C0</u>	D0	EO	FO	G0	
Copper (11) surpliate	Cu504	10/0	24 h	A0	B0		D0	E0	FO	GO	
Ferrous (II) ablarida	FeCl	10%	1 h	<u><u>A</u>0</u>	BU	<u>C0</u>	D0	E0	FO	GO	
	10012	10/0	24 h	A0	B0		D0	E0	FO	GO	
Ferric (III) chlorida	FeC1	10%	1 h	Δ0	BU D0	<u>C0</u>	D0	E0	FO	GO	
	10013	10/0	24 h	Δ0	BU BU		D0	E0	FO	GO	
Potassium iodida	KI	10%	27 II 24 h		BU D0	<u>C0</u>	D0	EO	EO	GO	
Potassium ovalata	KI K.C.O	1070	24 II 24 h	A0	D0 D0	<u>C0</u>	D0	E0	<u>F0</u>	<u>G0</u>	
Potossium	$K_2 C_2 O_4$	10/0 50/. in	24 II 2 min	A0 A5	D0 D0	<u>C0</u>	D0	EO	<u>F0</u>	<u>G0</u>	
r otassiulli permanagnata	KIVIIIO4	570 III H.O	∠ 11111 1 b	АЗ 16			D0	E0 E0	ГU Е0	GO	
Silver nitrote	A gNO	20/	1 11	A0	DU	<u>C0</u>	D0	EO	E0	GO	
Sirver initiate	AginO3	∠ /0	111 24 h	A0	D0 D0		D0	EO	E0	GO	
L			∠ + 11	AU	00		00	E0	1.0	00	

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Salt solutions cont.										
Sodium carbonate	Na ₂ CO ₃	20%	1 h 24 b	A0	B0 B0	C0	D0	E0	F0 F0	G0 C0
	NUCO	100/	24 n	AU	B0	<u>C0</u>	D0	EU	FU	GO
Sodium thiosulphate	$Na_2S_2O_3$	10%	l h	A0	B0	CO	D0 D0	E0	F0 F0	GO
a 1. 1.1.		100/	24 h	AU	B0	<u>C0</u>	D0	EO	FO	GO
Sodium sulphite	Na ₂ SO ₃	10%	24 h	A0	B0	<u>C0</u>	D0	E0	FO	G0
Medical Chemicals		a = 0 / ·		1.6	D.A		5.0			
Aniline blue		2,5% in	l h	A6	BO	CO	D0	E0	FO	G0
		ethanol	24 h	A6	B0	<u>C0</u>	D0	EO	FO	GO
Betadine		75	l h	A0	B0	CO	D0	E0	FO	GO
skin cleanser		mg/ml	24 h	A5	BO	CO	D0	E0	FO	G0
Bromcresol green		0,4 %	24 h	A0	B0	C0	D0	E0	F0	G0
Eosin		1 % in	1 h	A6	B0	C0	D0	E0	F0	G0
		ethanol	24 h	A6	B0	C0	D0	E0	F0	G0
Glutaraldehyde		25%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A0	B0	C0	D0	E0	F0	G0
Hematoxylin		5%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A5	B0	C0	D0	E0	F0	G0
Hibitane		0,5%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A5	B0	C0	D0	E0	F0	G0
Iodine	I_2	2% in	2min	A6	B0	C0	D0	E0	F0	G0
		ethanol	1 h	A6	B0	C0	D0	E0	F0	G0
Iodoform		1% in	1 h	A6	B0	C0	D0	E0	F0	G0
		ethanol	24 h	A6	B0	C0	D0	E0	F0	G0
Methylrosanilinium		0,1%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A5	B0	C0	D0	E0	F0	G0
Disinfectants/cleaning c	ompounds									
Product	Manuf./Rep.									
Buraton 10F	Schülke &	1%	24 h	A0	B0	C0	D0	E0	F0	G0
^{?"} _	Mayr	10%	24 h	A0	B0	C0	D0	E0	F0	G0
Citrosteril	Fresenius	Cons.	24 h	A0	B0	C0	D0	E0	F0	G0
Debisan	Nordex	1 %	24 h	A0	B0	C0	D0	E0	F0	G0
·''_		10%	24 h	A0	B0	C0	D0	E0	F0	G0
Decon-Spore 200 Plus	Veltek	0,5 %	24 h	A0	B0	C0	D0	E0	F0	G0
_	Associates,Inc	5%	24 h	A0	B0	C0	D0	E0	F0	G0
Dialox	Gambro	Cons.	24 h	A0	B1	C0	D0	E0	F0	G0
Gevisol	Schülke &	0.5%	24 h	A0	B0	C0	D0	E0	F0	G0
"	Mayr	5%	24 h	A5	B1	C0	D0	EO	F0	G0
Incidur	Henkel	0.5%	24 h	A0	B0	C0	D0	E0	F0	G0
" _		3%	24 h	A0	B0	C0	D0	EO	F0	G0
Lycetol AF	Schülke &	1%	24 h	A0	B0	C0	D0	E0	F0	G0
"_	Mayr	5%	24 h	A0	B1	C0	D0	EO	F0	G0
Melsept	B Braun	1%	24 h	A0	B0	C0	D0	E0	FO	G0
"		5%	24 h	A0	B0	C0	D0	EO	F0	G0
Perform	Schülke &	0.75%	24 h	A0	B0	C0	D0	E0	FO	G0
"_	Mayr	2,5%	24 h	A0	BO	C0	D0	ΕŌ	F0	G0
Sekumatic	Henkel	0.5%	24 h	A0	BO	CO	D0	EO	FO	G0
"		5%	24 h	A0	B0	CÕ	D0	E0	F0	G0
Sekusept Plus	Henkel	1%	24 h	A0	BO	CO	D0	EO	FO	G0
"		5%	24 h	A0	B0	CÕ	D0	E0	F0	G0
Spitacid	Henkel	Cons	1 h	A0	B0	CO	D0	EO	FO	G0
~		00110.	24 h	A0	B1	CO	D0	E0	FO	G0
Terralin N	Schülke &	1%	24 h	A0	B0	CO	D0	EO	FO	G0
"	Mavr	10%	1 h	A0	B0	CO	D0	E0	FO	G0
"·_		10%	24 h	A0	B1	CÕ	D0	E0	FO	G0
Tiutol KF		20/0	24 h	10	B0	<u>C0</u>	D0	E0	FO	G0
	B Braun	3%	24 n	AU	1317					U V
" -	B. Braun	3% 10%	24 n 24 h	A0 A0	B0	CO	D_0	E0	FO	G0
"- Virkon S	B. Braun	3% 10% 1%	24 h 24 h 24 h	A0 A0 A0	B0 B0	<u>C0</u>	D0 D0	E0 E0	F0 F0	G0 G0
Virkon S	B. Braun Sterisol AB	3% 10% 1% 2.5%	24 h 24 h 24 h 24 h	A0 A0 A0	B0 B0 B0	C0 C0 C0	D0 D0 D0	E0 E0 E0	F0 F0 F0	G0 G0 G0
Virkon S "- Incidin Plus	B. Braun Sterisol AB	3% 10% 1% 2,5%	24 h 24 h 24 h 24 h 24 h 24 h	A0 A0 A0 A0	B0 B0 B0 B0	C0 C0 C0 C0	D0 D0 D0 D0	E0 E0 E0 E0	F0 F0 F0 F0	G0 G0 G0 G0
Virkon S <u>-</u> Incidin Plus	B. Braun Sterisol AB Ecolab	3% 10% 2,5% 1% 5%	24 h 24 h 24 h 24 h 24 h 24 h 24 h	A0 A0 A0 A0 A0 A0 A0	B0 B0 B0 B0 B0 B0	C0 C0 C0 C0 C0	D0 D0 D0 D0 D0	E0 E0 E0 E0 E0 F0	F0 F0 F0 F0 F0 F0	G0 G0 G0 G0 G0



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Disinfectants/cleaning c Product	ompounds. Manuf./Rep.	cont.	_			_	_			_
Incidin Extra N	Ecolab	1%	24 h	A0	B0	C0	D0	E0	F0	G0
		5%	24 h	A0	B0	C0	D0	E0	F0	G0
Mikrobac forte	BODE	1%	24 h	A0	B0	C0	D0	E0	F0	G0
	Chemi	5%	24 h	A0	B0	C0	D0	E0	F0	G0
Hexaquart plus	B. Braun	1%	24 h	A0	B0	C0	D0	E0	F0	G0
		2,5%	24 h	A0	B0	C0	D0	E0	F0	G0
Miscellaneous chemical	\$									
EDTA	$C_{10}H_{16}N_2O_8$	10%	24 h	A0	B0	C0	D0	E0	F0	G0
Glycerol			24 h	A0	B0	C0	D0	E0	F0	G0
Hydrogen peroxide	H_2O_2	35%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A0	B0	C0	D0	E0	F0	G0
Olive oil			24 h	A0	B0	C0	D0	E0	F0	G0
Phenol	C_6H_6O	5%	2 min	A0	B0	C0	D0	E0	F0	G0
			1 h	A0	B1	C0	D0	E0	F0	G0
			24 h	A0	B1	C0	D0	E0	F0	G0
Sodium hypochlorite	NaOCl	12%	1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A0	B0	C0	D0	E0	F0	G0
Brake fluid	APE	Cons	1 h	A0	B0	C0	D0	E0	F0	G0
Super DOT 4	Components	AB	24 h	A0	B0	C1	D1	E5	F0	G0
Hydraulic fluid		Cons	1 h	A0	B0	C0	D0	E0	F0	G0
DET 26			24 h	A0	B0	C0	D0	E0	F0	G0
2-Ethylhexyl acrylate	$C_{11}H_20O_2$		1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A0	B0	C0	D1	E0	F0	G0
Methylmethacrylate	$C_5H_8O_2$		1 h	A0	B1	C0	D1	E0	F0	G0
			24 h	A0	B1	C0	D1	E0	F0	G0
2-Propanol (IPA)	C ₃ H ₈ O		1 h	A0	B0	C0	D0	E0	F0	G0
			24 h	A0	B0	C0	D0	E0	F0	G0

The swelling disappears after 1-2 days. H Slight damage to polyurethane surface.

H Total damage to polyurethane surface.

RESISTANCE TO CHEMICALS

Key

- A0 No change in lightness or colour
- A1 Somewhat lighter surface
- A2 Lighter surface
- A3 Somewhat darker surface
- A4 Darker surface
- A5 Somewhat discoloured surface
- A6 Discoloured surface
- B0 No change in gloss or matness
- B1 Somewhat mat surface
- B2 Mat surface
- B3 Somewhat glossy surface
- B4 Glossy surface
- C0 No change in patchiness
- C1 Somewhat patchy or spotty surface
- C2 Patchy or spotty surface
- D0 No change in evenness
- D1 Somewhat uneven or porous surface
- D2 Uneven and porous surface
- D3 Somewhat crackled surface
- D4 Crackled surface
- E0 No brittleness, stickiness or softening
- E1 Some surface brittleness
- E2 Brittle surface
- E3 Some surface stickiness
- E4 Sticky surface
- E5 Somewhat softened
- E6 Softened
- F0 No change in size or flatness
- F1 Some swelling
- F2 Swelling
- F3 Slight shrinkage
- F4 Shrinkage
- F5 Some bulging
- F6 Bulging or distortion
- G0 No delamination
- G1 Delamination of two or more layers
- H Other changes noted (text en clair)

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- Basis-of-Design Product: Subject to compliance with requirements, provide product Α. indicated on Drawings or comparable product by one of the following:
 - Benjamin Moore & Co. 1.
 - 2. PPG Paints.
 - 3. Sherwin-Williams Company (The).
- Β. Source Limitations: Obtain each paint product from single source from single manufacturer.
- 2.2 PAINT PRODUCTS, GENERAL
 - Α. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
 - Β. Colors: As indicated in a color schedule.
 - 1. Ten percent of surface area will be painted with deep tones.

2.3 PRIMERS

- Interior Latex Primer Sealer: Water-based latex sealer used on new interior plaster, Α. concrete, and gypsum wallboard surfaces.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); PrepRite Block Filler, B25W25 Series or comparable product by one of the following:
 - Benjamin Moore & Co. a.
 - PPG Paints: PPG Industries. Inc. b.

2.4 WATER-BASED FINISH COATS

- Interior, Latex, Eggshell: Pigmented, water-based paint for use on primed/sealed Α. interior plaster and gypsum board, and on primed wood and metals.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following: a.
 - Benjamin Moore & Co.
 - PPG Paints; PPG Industries, Inc. b.
 - 2. Gloss and Sheen Level: Manufacturer's standard eggshell finish .

- B. Interior, Latex, Semigloss: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.
 - <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 a. Benjamin Moore & Co.
 - b. PPG Paints; PPG Industries, Inc.
 - 2. Gloss Level: Manufacturer's standard semigloss finish .

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- G. Aluminum Substrates: Remove loose surface oxidation.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- I. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- 3.3 INSTALLATION
 - A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
 - B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

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

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- 3.6 INTERIOR PAINTING SCHEDULE
 - A. CMU Substrates:

- 1. High-Performance Architectural Latex System P1, P2 :
 - a. Block Filler: Interior/exterior latex block filler.
 - b. Prime Coat: Alkali-resistant, water-based primer.
 - c. Intermediate Coat: Matching topcoat.
 - d. Topcoat: Interior, latex, high-performance architectural coating, eggshell .
- B. Steel Substrates:
 - 1. High-Performance Architectural Latex System P4 :
 - a. Prime Coat: Alkyd quick-dry primer for metal Shop primer specified in Section where substrate is specified.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Topcoat: Interior, latex, high-performance architectural coating, semigloss.
- C. Gypsum Board and Plaster Substrates:
 - 1. High-Performance Architectural Latex System P1, P2 :
 - a. Prime Coat: Interior latex primer sealer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, high-performance architectural coating, [eggshell] .

END OF SECTION 09 91 23

SECTION 10 11 00 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Visual display board assemblies.
- 1.2 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Shop Drawings: For visual display units.
 - 1. Include plans, elevations, sections, details, and attachment to other work.
 - 2. Show locations of panel joints
- 1.3 CLOSEOUT SUBMITTALS
 - A. Maintenance data.
- 1.4 WARRANTY
 - A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period:
 - a. 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
 - A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 76-200 or less.
 - 2. Smoke-Developed Index: 450 or less.

2.2 VISUAL DISPLAY BOARD ASSEMBLIES

- A. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide EVERWhite Whiteboards; or comparable product by one of the following:
 - 1. Aywon.
 - 2. Bangor Cork.
 - 3. Claridge Products and Equipment, Inc.

VISUAL DISPLAY UNITS 10 11 00 - Page 1 of 3

- B. Visual Display Board Assembly: factory fabricated.
 - 1. Assembly: markerboard .
 - 2. Corners: Square .
 - 3. Width: As indicated on Drawings .
 - 4. Height: As indicated on Drawings .
- C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
 - 1. Color: White .
- D. Aluminum Frames: Fabricated from not less than 0.062-inch- thick, extruded aluminum; standard size and shape .
 - 1. Aluminum Finish: Clear anodic finish.
- E. Joints: Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.

2.3 MARKERBOARD PANELS

- A. Porcelain-Enamel Markerboard Panels: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction, consisting of moisture-barrier backing, core material, and porcelain-enamel face sheet with high -gloss finish. Laminate panels under heat and pressure with manufacturer's standard, flexible waterproof adhesive.
 - 1. Face Sheet Thickness: 0.021 inch uncoated base metal thickness.
 - 2. Hardboard Core: 1/4 inch thick; with 0.015-inch- thick, aluminum sheet backing.
 - 3. Laminating Adhesive: Manufacturer's standard moisture-resistant thermoplastic type.

2.4 MATERIALS

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard twoor three-coat process.
- B. Natural-Cork Sheet: Seamless, single-layer, compressed fine-grain cork sheet; bulletin board quality; face sanded for natural finish ; with surface-burning characteristics indicated.
- C. Vinyl Fabric: Mildew resistant, washable, complying with ASTM F793/F793M, Type II, burlap weave ; weighing not less than 13 oz./sq. yd.; with surface-burning characteristics indicated.
- D. Hardboard: ANSI A135.4, tempered.
- E. Extruded Aluminum: ASTM B221, Alloy 6063.
- F. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.
- 2.5 ALUMINUM FINISHES
 - A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
- PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Factory-Fabricated Visual Display Board Assemblies:
 - 1. Adhere to wall surfaces with egg-size adhesive gobs at 16 inches o.c., horizontally and vertically.
 - 2. Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.

END OF SECTION 10 11 00

VISUAL DISPLAY UNITS 10 11 00 - Page 3 of 3

SECTION 12 35 53.16 - PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Plastic-laminate-clad laboratory casework.
 - 2. Countertops.
 - 3. Laboratory accessories.
 - 4. Water and laboratory gas service fittings.
 - 5. Electrical and communication service fittings.
 - B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood blocking for anchoring laboratory casework.
 - 2. Section 09 22 16 "Non-Structural Metal Framing" for reinforcements in metalframed partitions for anchoring laboratory casework.
 - 3. Section 09 65 13 "Resilient Base and Accessories" for resilient base applied to laboratory casework.

1.2 DEFINITIONS

- A. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.
- B. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.
 - 1. Ends of cabinets are defined as "exposed" except ends are defined as "concealed" where installed directly against and completely concealed by walls or other cabinets.
- C. Plastic Laminate: High-Pressure Decorative Laminate (HPDL).
- D. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches or more above floor and bottoms of cabinets more than 24 inches, but less than 48 inches above floor, are defined as "semiexposed."

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site 1 College Place Claremont NH 03743.

1.4 COORDINATION

- A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.
- B. Coordinate installation of laboratory casework with installation of laboratory equipment.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Plastic-laminate-clad laboratory casework.
 - 2. Countertops.
 - 3. Laboratory accessories.
 - 4. Water and laboratory gas service fittings.
 - 5. Electrical and communication service fittings.
- B. Shop Drawings: For laboratory casework.
 - 1. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
 - 2. Indicate types and sizes of casework.
 - 3. Indicate manufacturer's catalog numbers for casework.
 - 4. Show fabrication details, including types and locations of hardware.
 - 5. Indicate locations and types of service fittings.
 - 6. Include details of exposed conduits, if required, for service fittings.
 - 7. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and laboratory equipment.
 - 8. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Samples: For plastic laminate.
- D. Samples for Initial Selection: For plastic laminate and other materials requiring color selection.
- E. Samples for Verification: For each type of casework, exposed-hardware, and countertop-material finish, in manufacturer's standard sizes.
 - 1. Base Cabinet: One full-size , 16-inch- wide, finished base cabinet complete with hardware, doors, and drawers but without countertop.
 - 2. Full-Size Samples: Maintain at Project site during construction in an undisturbed condition as a standard for judging the completed Work. Unless otherwise indicated, approved sample units may become part of the completed Work if in undisturbed condition at time of Substantial Completion. Notify Architect of their locations.

PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK 12 35 53.16 - Page 2 of 10

1.6 INFORMATIONAL SUBMITTALS

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet-work are complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Established Dimensions: Where laboratory casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Field Measurements: Where laboratory casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- D. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

- 2.1 CASEWORK, GENERAL
 - A. Casework Product Standard: Comply with SEFA 8-PL, "Laboratory Grade Plastic Laminate Casework."
 - B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2.2 PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK
 - A. <u>Basis-of-Design Product</u>: Subject to compliance with requirements, provide Diversified Casework; Axis Infinity Model #26300 & #26320 or comparable product by one of the following:
 - 1. Manufactures tables below are approved with the following modification to standard product: shall have molded marine edge on work surface, shall have DurconD99 sink with built up ledge meeting ADA reach in, shall have metal base cabinet housing D99 sink, shall provide watersaver VR5800WSA with powder coat finish, shall provide remote control height adjustment, shall provide undercounter storage for upright rods and cross bars.
 - 2. Campbell Rhea Magnetar: .

PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK 12 35 53.16 - Page 3 of 10

- 3. Kewaunee student station
- 4. CIF student station
- 5. Leonard Peterson Student station
- B. Design:
 - 1. Flush overlay.
- C. Grain Direction for Wood Grain Plastic Laminate:
 - 1. Doors: Vertical with continuous vertical matching.
 - 2. Drawer Fronts: Vertical with continuous vertical matching .
 - 3. Face Frame Members: Lengthwise.
 - 4. End Panels: Vertical.
 - 5. Bottoms and Tops of Units: Side to side.
 - 6. Knee Space Panels: Vertical.
 - 7. Aprons: Vertical.
- D. Exposed Materials:
 - 1. Plastic-Laminate Grade: VGS.
 - a. Colors and Patterns: As selected by Architect from manufacturer's full range .
 - 2. Edgebanding: .Plastic laminate matching adjacent surfaces .
 - a. PVC Edgebanding Color: As selected by Architect from casework manufacturer's full range .
- E. Semiexposed Materials:
 - 1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.
 - a. Colors and Patterns: As selected by Architect from manufacturer's full range.
 - b. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.
- F. Concealed Materials:
 - 1. Plywood: Hardwood plywood.
 - 2. MDF.
- 2.3 PLASTIC-LAMINATE CABINET MATERIALS
 - A. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
 - B. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
 - C. Particleboard: ANSI A208.1, Grade M-2.

- D. Hardboard: ANSI A135.4, Class 1 tempered.
- E. Plastic Laminate: HDPL complying with ISO 4586-3.
- F. PVC Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3.0 mm thick at doors and drawer fronts, 1.0 mm thick elsewhere.
- G. Thermally Fused Laminate (TFL) Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper.
 - 1. Edgebanding for Thermally Fused Laminate (TFL) Panels: PVC or polyester edgebanding matching thermally fused laminate panels.
- 2.4 CABINET HARDWARE
 - A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
- 2.5 COUNTERTOPS
 - A. General: Provide laboratory countertops with integral sink as indicated on Drawings.
 - B. Core Materials for Plastic Laminate:
 - 1. Particleboard: ANSI A208.1, Grade M-2.
 - C. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
 - 1. <u>Basis-of-Design Product:</u> Subject to compliance with requirements, provide Durcon; a Wilsonart Company; SPC-CR Carbon Black or comparable product by one of the following:
 - a. American Epoxy Scientific LLC.
 - b. Durcon; a Wilsonart Company.
 - 2. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi.
 - b. Modulus of Elasticity: Not less than 2,000,000 psi.
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F.
 - f. Chemical Resistance: Minimum acceptable chemical-resistance performance to result in no more than four (4) Level 3 conditions when tested with indicated reagents in accordance with SEFA 3.
 - 3. Color: Carbon Black .
- 2.6 CABINET FABRICATION
 - A. Construction: Provide plastic-laminate laboratory casework of the following minimum construction:

- 1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch- thick particleboard.
- 2. Shelves: 3/4-inch- thick plywood.
- 3. Exposed Backs of Cabinets: 1/2-inch- thick particleboard or MDF.
- 4. Backs of Cabinets: 1/4-inch- thick, veneer-core hardwood plywood dadoed into sides, bottoms, and tops where not exposed unless otherwise indicated.
- 5. Drawer Fronts: 3/4-inch- thick particleboard.
- B. Filler and Closure Panels: Provide where indicated and as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as adjacent exposed casework surfaces unless otherwise indicated.
 - 1. Provide knee-space panels (modesty panels) at spaces between base cabinets, where cabinets are not installed against a wall or where space is not otherwise closed .
 - 2. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.
 - 3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.

2.7 COUNTERTOP FABRICATION

- A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2, unless otherwise indicated.
 - 2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches less than sink depth. Provide in same material as strainer.
- C. Epoxy:
 - 1. Countertops: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
 - a. Follow Sheldon Axis Infinity 26200 & 26220 instructions
 - b. Marine-Edge Configuration: 1-inch minimum thickness, with integral or applied raised edge.
 - 1) Edges and Corners: Beveled .
 - c. Construction: Uniform throughout full thickness .
 - 2. Sinks: basis of design: Diversified Casework Synergy Sink. Install based on manufacturer instructions. minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.

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2.8 LABORATORY ACCESSORIES

- A. Stainless Steel Pegboards: Stainless steel pegboards with removable polypropylene pegs and stainless steel drip troughs with drain outlet.
- 2.9 WATER AND LABORATORY GAS SERVICE FITTINGS
 - A. <u>Basis-of-Design Product</u>: Subject to compliance with requirements, provide Diversified Casework; # 80020 Unicast cold water/gas vandal resistant fixture or comparable product by one of the following:
 - 1. Broen A/S.
 - 2. Chicago Faucets; Geberit Group.
 - 3. WaterSaver Faucet Co.
 - B. Service Fittings: Provide units that comply with SEFA 7, "Laboratory Fixtures -Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
 - 1. Provide units that comply with "Vandal-Resistant Fittings" recommendations in SEFA 7.
 - C. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
 - 1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
 - D. Finish: Acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes.
 - 1. Provide chemical-resistant powder coating in laboratory casework manufacturer's standard metallic brown, aluminum, white, or other color as approved by Architect.
 - E. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
 - 1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
 - 2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
 - 3. Self-Closing Valves: Provide self-closing valves where indicated.
 - F. Ground-Key Cocks: Tapered core and handle of one-piece forged brass, ground and lapped, and held in place under constant spring pressure. Provide units designed for working pressure up to 40 psig, with serrated outlets.
 - G. Handles: Provide three- or four-wing, molded-plastic or powder-coated-metal handles for valves unless otherwise indicated.

- 1. Provide lever-type handles for ground-key cocks. Lever handle aligns with outlet when valve is closed and is perpendicular to outlet when valve is fully open.
- H. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant. Comply with SEFA 7 for colors and embossed identification.
- 2.10 ELECTRICAL AND COMMUNICATION SERVICE FITTINGS
 - A. Service Fittings, General: Provide units complete with metal housings, receptacles, switches, pilot lights, cover plates, accessories, and gaskets required for mounting on laboratory casework.
 - B. Receptacles:
 - Duplex GFCI Convenience Receptacles: 125 V, 20 A; NEMA WD 6, Configuration 5-20R; non-feed-through type with integral LED indicator light.
 a. Standards: Comply with NEMA WD 1, UL 498, UL 943 Class A, and FS W-C-596.
 - 2. Color of Receptacles: Ivory unless otherwise indicated or required by NFPA 70.
 - C. Cover Plates: Provide satin-finish, chrome-plated cover plates with formed, beveled edges.
 - D. Pedestal-Type Fittings: Cast-aluminum housings with sloped single face or two faces, as indicated, with neoprene gasket under base and with concealed mounting holes in base for attaching to laboratory casework. Provide holes tapped for conduits.
 - E. Finishes for Service-Fitting Components: Provide housings or boxes for pedestal- and line-type fittings with manufacturer's standard baked-on, chemical-resistant enamel in color as selected by Architect from manufacturer's full range.
- PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION OF CASEWORK
 - A. Comply with installation requirements in SEFA 2. Install level, plumb, and true in line; shim as required using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
 - 2. Variation of Faces of Casework from a True Plane: 1/8 inch in 10 feet.

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- B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.
- C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than two fasteners per side.
- D. Install hardware uniformly and precisely.
- E. Adjust operating hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
- 3.3 INSTALLATION OF COUNTERTOPS
 - A. Comply with installation requirements in SEFA 2. Abut top and edge surfaces true in plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints where indicated on Shop Drawings.
 - B. Field Jointing: Where possible, make in same manner as shop-made joints, using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
 - C. Fastening:
 - 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 - 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
 - 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
 - D. Provide holes and cutouts required for service fittings.
 - E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
 - F. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
 - G. Dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

- A. Comply with installation requirements in SEFA 2.
- B. Drop-in Installation of Epoxy Sinks: Rout groove in countertop to receive sink rim if not shop prepared. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess adhesive and sealant while still wet and finish joint for neat appearance.
- C. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.
- D. Semiflush Installation of Stainless Steel Sinks: Before setting, apply sink and countertop manufacturers' recommended sealant under rim lip and along top. Remove excess sealant while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF LABORATORY ACCESSORIES

- A. Install accessories in accordance with Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions.
- B. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.
- 3.6 INSTALLATION OF SERVICE FITTINGS
 - A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.
 - B. Install fittings in accordance with Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions. Set bases and flanges of sink- and countertopmounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

3.7 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches o.c.

END OF SECTION 12 35 53.16

SECTION 12 36 61.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. Section Includes:
 - 1. Solid surface material countertops.
 - 2. Solid surface material backsplashes.
 - 3. Solid surface material end splashes.
 - 4. Solid surface material sinks.
 - B. Related Requirements:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 12 35 53.16 Plastic-Laminate-Clad Laboratory Casework .

1.2 ACTION SUBMITTALS

- A. Product Data: For countertop materials and sinks.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.
- C. Samples for Verification: For the following products:
 - 1. Countertop material, 6 inches square.
 - 2. long.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For fabricator.
- 1.4 CLOSEOUT SUBMITTALS
 - A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.
 - B. Warranty
- 1.5 QUALITY ASSURANCE
 - A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.

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- B. Installer Qualifications: Fabricator of countertops.
- 1.6 FIELD CONDITIONS
 - A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.
- 1.7 COORDINATION
 - A. Coordinate locations of utilities that will penetrate countertops or backsplashes.
- PART 2 PRODUCTS
- 2.1 Fire Rating: Class C
- 2.2 Low-emitting requirements General: For Paints and Coatings, Adhesives and Sealants, Flooring products, Ceiling finishes, Wall finishes, any insulation products internal to the weatherproofing envelope
- 2.3 SOLID SURFACE COUNTERTOP MATERIALS
 - A. Solid Surface Material: Solid Phenolic Compact (SPC) Laboratory Work Surfaces:
 - 1. <u>Basis-of-Design Product</u>: Subject to compliance with requirements, provide Durcon SPC work surfaces, SPC-CR CARBON BLACK is a self-supporting flat panel based on thermosetting resins, homogeneously reinforced with cellulose fibers and manufactured under high pressure. The panels have a pigmented resincore with a decorative surface that is electron-beam cured. or comparable product by one of the following:
 - a. DuPont; DuPont de Nemours, Inc.
 - b. LG Hausys, Ltd.
 - 2. Colors and Patterns: As indicated on Interior Finish materials Legend .
 - 3. Finish: Matte Sheen

2.4 FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Lab .
- B. Solid Phenolic Compact Worksurfaces:
 - 1. Thickness:
 - a. 1" (25mm)
 - b. Check each sheet at factory for required thickness.
 - c. Maximum variation in thickness: plus or minus 1/16 inch (1.6 mm) from corner to corner.
 - 2. Warpage:
 - a. Inspect tops for warpage prior to fabrication by placing on true flat surface.

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- b. Maximum allowable warpage: 1/16 inch (1.5 mm) in 36 inch (900 mm) span or 3/16 inch(4.5 mm) in 96 inch (2400 mm) span
- 3. Fabrication:
 - a. Shop fabricate in longest practical lengths.
 - b. Bond joints with highly chemical resistant cement with properties and color similar to basematerial.
 - c. Provide 1/8 inch (3 mm) drip groove at underside of exposed edges, set back 1/2 inch (13mm) from face.
 - d. Finish exposed edges.
- 4. Edge Treatment: Standard 1/8 inch (2mm) chamfered edge.
- 5. Fabricate tops flat with 1/4 inch (6mm) raised epoxy resin marine edge.
- 6. corner treatment: exposed corners shall be eased slightly for safety.
- C. Back and end splashes:
 - 1. Supplied loose for field installation.
 - 2. Same material and thickness as worksurfaces.
 - 3. 4 inches (100 mm) high unless otherwise indicated
- D. Joints:
 - 1. Fabricate countertops in sections for joining in field.
 - a. Joint Locations: Not within 18 inches of a sink or cooktop and not where a countertop section less than 36 inches long would result, unless unavoidable.
 - b. Make Joints between two benches level.
- E. Epoxy Resin Sinks: Basis of design: Subject to compliance with requirements, provide Sheldon Synergy Sink is a molded epoxy resin top and 19 gallon sink; two tiered with anti-splash feature from Sheldonlabs line of Diversified Casework.
 - 1. The molded epoxy resin sink incorporates a two-tiered depth design to allow ADA accessibility at the front and a deep clean-up section at the rear of the sink. The sink has a unique curvilinear shape where the front is curved to match the curve of the counter top. The sink is 20-1/4" from the center of the front curve to the rear. The width of the curved front is 28-1/2" and the width of the rear is 22-1/2". The width of the sides is 16" and the overall depth of the sink is 11-1/2".
 - 2. The front section of the sink has an integrally molded ADA ledge 28-1/2" wide, 8" front to back at the center of the curve, 5" deep from the sink top, and has molded drain grooves. The rear of the ADA ledge is sloped and designed to prevent splash from the two (2) water fixtures. The rear of the sink is a minimum of 12-1/4" from the rear of the ADA ledge. The sink shall accommodate approximately nineteen (19) gallons of water.
 - 3. Unicast water fixtures are mounted at a slight angle to provide an anti-splash characteristic flowing on the sloped portion of the sink.
 - 4. Synergy sink mounting options in perimeter casework.
 - 5. Synergy sink, curvilinear resin top, and Unicast water fixtures can be mounted within ADA compliant perimeter casework assembly at 34" height, supported by a metal base, sink shroud, and removable knee space panel that provides access to service rough-in area behind panel. Provide this arrangement when specified.

2.5 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."
- C. VOC Content Requirements for Wet Applied Products: All adhesives and sealants wetapplied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, amended October 26, 2017, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. The provisions of SCAQMD Rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC regulations.
- D. Methylene chloride and perchloroethylene shall not be intentionally added in paints, coatings, adhesives, or sealants.
- E. Do not use adhesives that contain urea formaldehyde.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until cabinets have been installed.
- B. Confirm that surfaces to receive tops are plumb and level, with maximum deflection of 1/4 inch (6 mm) in 20 feet (6 m).

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Fasten tops to supporting construction with adhesives appropriate for use with adjoining constructionand as recommended by manufacturer.
- C. Form field joints using manufacturer's recommended adhesive. Form joints to be inconspicuous andnonporous. Mask areas of countertops adjacent to joints to prevent adhesive smears.
- D. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- E. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- F. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed,

and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

G. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION 12 36 61.16

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SECTION 21 00 00

FIRE SUPPRESSION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Fire Suppression system(s), quality expectations, materials, and general requirements.

1.02 SYSTEM(S) DESCRIPTION

- A. Furnish and install all labor and materials, including all incidentals required, to provide 100% approved automatic sprinkler coverage of the renovation areas within River Valley Community College (RVCC) as defined on drawings and specified herein. All work necessary to extend and expand the existing system as required to address the contract area shall be provided.
- B. The contract areas shall be addressed by expansion of existing zone and branch mains that currently serves the contract area(s).
- C. Provide complete and detailed, stamped working drawings and calculations prepared by a registered Professional Engineer or NICET Level 3 Certified designer.
- 1.03 RELATED DIVISIONS and SECTIONS
 - A. Project General Requirements
 - B. DIVISION 01 General Requirements
 - C. DIVISION 07 Thermal and Moisture Protection
 - D. DIVISION 22 Plumbing
 - E. DIVISION 23 Heating, Ventilating and Air-Conditioning (HVAC)
 - F. DIVISION 25 Integrated Automation
 - G. DIVISION 26 Electrical

1.04 REFERENCES

- A. 2018 International Building Code with State of NH Amendment
- B. 2018 NFPA 101, Life Safety Code with State of NH Amendments
- C. New Hampshire State Fire Code Saf-C6000
- D. 2018 NFPA 1, Fire Prevention Code with State of NH Amendments
- E. 2018 International Plumbing Code with State of NH Amendments
- F. 2018 International Mechanical Code with State of NH Amendments
- G. 2018 International Energy Conservation Code with State of NH Amendments
- H. 2020 National Electric Code with State of NH Amendments
- I. City of Claremont prevailing ordinances, rules and regulations
- J. City of Claremont Fire Department(s) rules and regulations
- K. All applicable ASTM Standards.

1.05 SUBMITTALS

FIRE SUPPRESSION 21 00 00 - Page 1 of 2

- A. See SECTION 01 30 00 Administrative Requirements, for submittal procedures.
- B. Ordering of equipment and materials for installation shall not proceed without an approved submittal.

END OF SECTION 21 00 00

SECTION 21 01 00

OPERATION AND MAINTENANCE OF FIRE SUPPRESSION

PART 1 GENERAL

1.01 INTENT

- A. Furnish and install all labor and materials, including all incidentals required, to provide 100% approved automatic sprinkler coverage of the renovated area within RVCC as defined on drawings and specified herein. All work necessary to extend and expand the existing system as required to address the contract area shall be provided.
- B. All sprinkler work and equipment shall comply with current RVCC Construction Standards, including concealed heads and fire sealing details.
- C. The existing sprinkler should remain active whenever and wherever possible and be on during the (unoccupied) evening hours.

1.02 CODES AND PERMITS

- A. All work under this contract shall comply fully with requirements, rules and regulations of Agencies Having Jurisdiction (AHJ) including, but not limited to, the City of Claremont, New Hampshire, RVCC construction standards and the Owner's insurance company.
- B. Any changes that must be made to finished work to conform to regulations and codes shall be made at the Sprinkler Contractor's expense.
- C. Any conditions noted in the specifications which would be contrary to such regulations shall be brought to the attention of the Owner's representatives before work is installed.
- D. Permits and fees shall be obtained and paid for by the Sprinkler Contractor.
- E. Submit detailed construction drawings and have them approved by AHJ before installation. Obtain certification of inspection and approval from same agency.
- 1.03 GUARANTEE
 - A. The Sprinkler Contractor shall leave the entire Sprinkler System installed under this contract in proper working order and shall, without additional charge, replace any work or material installed which develops defects within one year from the date of final acceptance by the Owner's representatives, including all other work damaged by such defects.
 - B. Any apparatus that requires excessive service during the first year of operation shall be considered defective and shall be replaced.

1.04 DRAWINGS AND SPECIFICATIONS

- A. Any questions regarding specifications shall be addressed to the Owner's representatives before the bids close. After the closing of bids, the Owner's representative's interpretation of the meaning and intent of drawings and specifications shall be final.
- 1.05 APPROVALS
 - A. The Sprinkler Contractor shall obtain approval of the layout from the Claremont Fire Department and Owner representatives.
 - B. After satisfactory final inspection and test by the AHJ, a copy of the letter of acceptance shall be filed with the Owner's representatives.

1.06 CUTTING, PATCHING, FIRE SEALING AND AIR-TIGHT SEALING

- A. Cutting and patching shall be in accordance with the Sprinkler Contractor and Construction Manager contractual agreement.
- B. Pipe penetrations through all rated assemblies shall be fire-stopped as required to meet or exceed applicable UL criteria (including UL Design 905), and DIVISION 07.
- C. Seal all pipe penetrations through, and system specialties in, general construction within the procedure space to prevent air leakage into and from the room. Review air sealing means,

methods, and materials with the C.M. to ascertain project requirements and standards prior to bid.

END OF SECTION 21 01 00

SECTION 21 05 00

COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Sprinkler System Scope of Work shall include, but not be limited to, the following:
 - 1. Complete and detailed, stamped working drawings and calculations prepared by a registered Professional Engineer or NICET Level 3 Certified designer.
 - 2. Sprinklers and fittings.
 - 3. Supports, hangers, inserts and seismic bracing/restraints.
 - 4. Valves and specialties.
 - 5. Pipe sleeves, escutcheons, fire sealing and air-tight sealing of general construction penetrations within the contract area.
 - 6. Coordination of Fire Alarm System points with the Electrical Contractor.
 - 7. Miscellaneous itemized.
 - 8. Secure all required permits.

END OF SECTION 21 05 00

SECTION 21 06 00

SCHEDULES FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 MATERIALS AND SUBSTITUTIONS

- A. Sprinkler equipment shall be new and conform to the standards established in these specifications, and selected from "List of Inspected Fire Protection Equipment and Materials," published annually by UL and shall bear UL approved stamp or label.
- B. Trade names and specific manufacturers' model numbers define type and quality of materials and equipment required.
- C. Bid shall include all methods, materials, equipment, etc. as required to provide a complete installation.
- D. Uniformity Unless otherwise specified, equipment or materials of the same type or classification used for the same purpose shall be the product of the same manufacturer.
- E. Materials, products not approved may not be used in construction.

1.02 WORKMANSHIP

- A. All work shall be executed in a workmanlike manner and shall present a neat, mechanical appearance when completed. Work not approved by the Owner's representatives shall be replaced by the Sprinkler Contractor without additional charge.
- B. All piping, in general, shall be run as straight and direct as possible, forming right angles or parallel lines with the building walls and other pipes, and be neatly spaced. Check closely with other trades to prevent interferences. No claims will be allowed for extra work caused by failure to coordinate with others.

END OF SECTION 21 06 00

SECTION 21 08 00

COMMISSIONING OF FIRE SUPPRESSION

PART 1 GENERAL

1.01 COMMISSIONING OF SYSTEM(S)

A. The Sprinkler Contractor shall be responsible for commissioning the installed sprinkler system(s) in accordance with NFPA 13 coverage described procedures, Claremont Fire Department requirements and best trade practices.

1.02 TESTS AND FLUSHING

- A. After completion, subject sprinkler system to tests required by and in the presence of representatives of Claremont, New Hampshire Fire Department and Owner's representatives. Conduct, duration, and other details not covered by agencies' requirements, shall be in accordance with NFPA 13, AHJ adopted edition.
- B. Provide instruments, equipment, and pay expenses incurred in making test; obtain approvals, certificates.
- C. The system shall be thoroughly flushed before sprinklers are in place in order to free the system from any obstructing material which might clog the orifices of the sprinklers.
- D. Where evidence of stoppage appears in piping or equipment, disconnect, clean, repair, and reconnect obstructed parts. The Sprinkler Contractor shall bear cost of cuttings, patching and all other work necessitated by such cleaning and repairing.

END OF SECTION 21 08 00

SECTION 21 09 00

INSTRUMENTATION AND CONTROL FOR FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

- 1.01 FIRE ALARM SYSTEM INTERFACE
 - A. Fire Alarm System interface shall be as described and defined in DIVISION 26 ELECTRICAL.
 - B. The Sprinkler Contractor shall coordinate all specialty devices that require Fire Alarm System interface, i.e., tamper switches, flow switches, pressure switches, electric bell, etc., with the Electrical Contractor.

END OF SECTION 21 09 00

SECTION 21 10 00

WATER-BASED FIRE-SUPPRESSION SYSTEMS

PART 1 GENERAL

1.01 REQUIREMENTS

- A. The existing applicable wet sprinkler system zone shall be extended and reworked as required to address the Lab Renovation contract area within the existing community college.
- B. Concealed sprinkler heads shall be used and installed in ceilings or walls as indicated on the plan or best suited for the application. UL listed flexible sprinkler heads may be used provided expressed consent from the RVCC Project Manager is obtained during the submittal process.ho
- C. This contractor must have full regard for the Architect's intent to rearrange any exposed piping and/or heads to achieve aesthetic requirements. Extra heads and piping necessary to suit the desired placement shall be provided at no additional cost. Final layout shall comply with NFPA 13, AHJ adopted edition.
- D. The intent is that all piping will be run concealed in general construction. Piping may be run exposed only when approved by the Owner's representatives.
- E. Sprinkler equipment acceptable: Reliable, Tyco, Victaulic, AGF, Potter, Viking or approved equal.
- 1.02 PIPING CONNECTIONS
 - A. The Sprinkler Contractor's work shall begin at appropriate points of connection to the existing system zone(s) serving the contract area(s).
- 1.03 DRAIN AND TEST CONNECTIONS
 - A. Install horizontal piping graded to low points and in a manner to make it possible to test and empty entire system. Provide valves and piping of sizes and in locations as indicated and in accordance with requirements of NFPA 13, AHJ adopted edition. Inspection and test connection drains shall be piped to grade.
 - B. Extend test/drain valve discharge pipes to grade. Terminate pipes so that discharge will be visible. Use sight drain fittings if necessary. All termination pipes and other visible piping located exterior to the building shall be galvanized steel pipe.
- 1.04 SPRINKLERS
 - A. Sprinkler Heads:
 - 1. For exposed applications in unfinished areas and IT Closets, use natural brass finish pendants of appropriate temperature and response rating required for the application with safety cage. Approval of Architect required prior to ordering. Submit sample.
 - 2. In areas where heads are subject to damage, provide safety cages. Submit sample.
 - 3. For finished ceiling and wall applications, use white finish concealed ceiling or sidewall heads with rating bulb and matching cover/escutcheon, of appropriate temperature and response rating required for the application. Approval of Architect required prior to ordering. Submit sample.
 - 4. Use quick response heads as required by NFPA 13 and/or the AHJ.
 - B. Furnish extra sprinkler heads packed in suitable container along with sprinkler wrenches, per NFPA 13, AHJ adopted edition.

END OF SECTION 21 10 00

SECTION 21 11 00

FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

PART 1 GENERAL

1.01 PIPING MATERIALS, FITTINGS AND JOINTS

A. Sprinkler System piping material and installation practices shall conform to NFPA 13, AHJ adopted edition.

1.02 ANCHORS, SUPPORTS AND HANGERS

- A. Support sprinkler piping from building structure by means of hangers, inserts, etc., as required by NFPA 13, AHJ adopted edition.
- B. Hangers shall be clevis type or split ring supported from structure, and shall be designed to meet all applicable seismic criteria.
- C. Address seismic restraints and hanging criteria as it applies within the existing facility. Secure the services of a professional seismic consultant to review and design as required, plus administer construction/installations.
- 1.03 PIPE SLEEVES, ESCUTCHEONS
 - A. Provide proper sleeves to accommodate pipes passing through walls, floors, partitions, and provide escutcheons at exposed finished surfaces pierced by pipes. The Sprinkler Contractor shall not cut through any beams without written permission from the Owner's representative.
 - B. Extend sleeves 1¹/₂" above finished floor and pack space between pipe and sleeve as recommended in NFPA 13, AHJ adopted edition.
- 1.04 VALVES AND GAUGES
 - A. Control valves for sprinkler system: IBBM, solid wedge gate, rising stem OS&Y for 175 psi W.W.P. Install at entry station with electrically wired tamper switch. Wiring of fire alarm devices and associated sprinkler specialties shall be provided by the Electrical Contractor.
 - B. Provide approved gauges as required per NFPA 13, and approving authority.
 - C. Tamper switches shall be furnished and installed by Sprinkler Contractor, wired by the Electrical Contractor.
 - D. Valves acceptable: Watts, Milwaukee, AGF, Nibco, Victaulic and Ames.
- 1.05 VALVE SEALS, TAGS AND CHARTS
 - A. Provide copper wire and approved seal for each manually operated shut-off valve required to be sealed in open position.
 - B. Provide identification signs of standard design, fastened securely at designated locations as per NFPA 13, and Claremont, New Hampshire Fire Department.
 - C. Provide brass tags about 2" in diameter; stamp with designating number, secure with 12 gauge copper wire to spindle of all control valves.
 - D. For each building, provide electronic data and paper copies of drawings, calculations, equipment cuts and other operations and maintenance information as called for in DIVISION 01.

END OF SECTION 21 11 00

SECTION 22 00 00 PLUMBING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Plumbing system(s), quality expectations, materials, and general requirements.

1.02 SYSTEM(S) DESCRIPTION

- A. Plumbing systems of this contract shall include:
 - 1. System of sanitary waste and vent from each fixture to points of connection as indicated on the Plumbing drawings.
 - 2. Systems of hot and cold water distribution to all fixtures from mains where indicated.
 - 3. Fixtures as specified and/or indicated.
 - 4. Thermal insulation for all systems.
 - 5. Secure all required permits.
 - 6. Testing and adjusting of all systems.
 - 7. General Conditions of the contract.
- 1.03 RELATED DIVISIONS and SECTIONS
 - A. Project General Requirements
 - B. DIVISION 01 General Requirements
 - C. DIVISION 07 Thermal and Moisture Protection
 - D. DIVISION 21 Fire Suppression
 - E. DIVISION 23 Heating, Ventilating and Air-Conditioning (HVAC)
 - F. DIVISION 25 Integrated Automation
 - G. DIVISION 26 Electrical

1.04 REFERENCES

- A. 2018 International Building Code with State of NH Amendment
- B. 2018 NFPA 101, Life Safety Code with State of NH Amendments
- C. New Hampshire State Fire Code Saf-C6000
- D. 2018 NFPA 1, Fire Prevention Code with State of NH Amendments
- E. 2018 International Plumbing Code with State of NH Amendments
- F. 2018 International Mechanical Code with State of NH Amendments
- G. 2018 International Energy Conservation Code with State of NH Amendments
- H. 2020 National Electric Code with State of NH Amendments
- I. City of Claremont prevailing ordinances, rules and regulations
- J. City of Claremont Fire Department(s) rules and regulations
- K. All applicable ASTM Standards.

1.05 SUBMITTALS

PLUMBING 22 00 00 - Page 1 of 2

- A. See SECTION 01 30 00 Administrative Requirements, for submittal procedures.
- B. Ordering of equipment and materials for installation shall not proceed without an approved submittal.

END OF SECTION 22 00 00
OPERATION AND MAINTENANCE OF PLUMBING

PART 1 GENERAL

1.01 INTENT

- A. Furnish and install all plumbing work of this contract in accordance with governing codes, current River Valley Community College (RVCC) Construction Standards and in a workmanlike manner.
- B. The run and arrangement of all plumbing pipes shall be approximately as shown on the drawings and as directed during installation and shall be as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and be neatly spaced.
- C. Arrange work to avoid all interference with the work of all other trades. Consult with other contractors, and coordinate the location of their work with that of the others.

1.02 COLD WATER SYSTEMS

A. Cold water distribution systems shall supply water to all fixtures and other water consuming equipment and hot water heating equipment. Valved outlets for the use of other trades shall be furnished and installed complete.

1.03 GENERAL INSTALLATION OF PLUMBING PIPING

- A. Offsets shall be permitted only where required to permit the pipes to follow walls, where standard fittings shall be used.
- B. All risers shall be erected plumb and true and shall be parallel with walls and other pipes and be neatly spaced.
- C. All roughing, underground or concealed in floors or wall construction, shall be installed before the construction is closed up.
- D. Horizontal runs of piping, except where concealed in partitions, shall be kept as high up as possible and close to walls. Consult with other trades so that grouped lines shall not interfere with each other.
- E. The arrangement, positions, and connections of pipes, fixtures, drains and valves shown on the drawings shall be followed as closely as possible. However, the right is reserved by the Owner's representative to change locations of pipes and associated specialties to accommodate any conditions which may arise during the progress of the work, without additional cost. The responsibility for accurately laying out the work rests with the contractor.
- F. Piping shall be installed concealed in building construction in all finished areas.
 - Special precaution shall be taken in the installation of piping concealed to see that the piping is properly installed. Should it be necessary to correct piping so installed, this subcontractor shall be held liable for any injury caused to other work and the correction of piping.
- G. Pipe shall not be bent, flattened, or otherwise injured either before installation or during installation.
- H. Connections to fixtures shown to be installed concealed in building construction shall, in general, be carried concealed to a point above floor at wall (near fixtures), where they shall break out and rise exposed to fixtures, all as required. Exposed waste and supplies (including in cabinets) shall be chrome, except for kitchen work sinks. The chrome tailpiece connection to plumbing roughed behind the cabinet shall be a threaded compression fitting with extended escutcheon.
- I. Reducing fittings, unless otherwise approved in special cases, shall be used in making reduction in size of pipe. Bushing shall not be allowed unless specifically approved.

1.04 PLUMBING WATER PIPING CONSTRUCTION DETAILS

A. Pipe shall be supported as specified hereinafter.

- B. Pipe lines shall be run parallel and spaced to permit proper covering.
- C. Air chambers shall be Wade "Shok-Stop" or approved equal, and shall be installed on top of all hot and cold water risers on the upfeed system, on all individual hot and cold water fixture branch connections. Groups of fixtures may be served by one full branch sized air chamber.
- D. Piping, fittings, valves, supports, hangers, etc., exposed to view shall be painted or chrome as directed. This provision shall apply to all piping from the point that it leaves the wall to the point of final connection to the fixture.
- E. Any exposed piping and trim showing tool marks shall be removed and replaced with new materials without additional cost.
- F. Riser control valves shall be provided on all risers. Drain valves shall be provided at the heel of each riser inside of shut-off valves.
- G. Main shut-off valves shall be installed at each water connection at all tanks and other pieces of equipment.
- H. Valves shall be provided on all main branches from risers to groups of fixtures and access doors shall be provided to all such valves not readily accessible.
- I. Piping shall pitch to low points. All low points and any pockets caused by changes in elevation required by structural or other interferences shall be provided with drain valves.
- J. Branches to individual fixtures shall be of sizes as shown in the Fixture Schedule on the drawings.
- K. Vacuum breakers and backflow preventers shall be installed on all equipment and fixture connections as required by code and/or local ordinances.
- L. Connections to equipment such as tanks, pumps, and the like, shall be made with flanged or union connections.
- M. Where hot and cold water supply pipes connect to a combination supply fitting with a shut-off valve on its discharge, or the combination supply fitting is equipped with manual or thermostatic mixing valve, each hot and cold water supply pipe shall be equipped with a composition disc swing check valve ahead of the supply fitting.

1.05 SANITARY SEWER AND DRAINAGE SYSTEM

- A. Complete system of sanitary sewer and drainage shall be provided. The system shall include all risers, branches with all pipes, fittings, hangers, anchors, plumbing fixtures, special fixture wasters, etc., to make the system complete.
- B. Branch connections shall be made with "Wye" and long "Tee-Wye" fittings. All fittings shall conform to code requirements.
 - 1. Short 1/4 bends, common offsets and double hubs will not be permitted.
 - 2. Short "Tee-Wye" fittings are to be used in vertical piping only.
- C. Drains shall be run at minimum grade of 1/8" per foot downward in the direction of flow unless otherwise indicated. Branch connections to stacks from fixtures shall pitch 1/4" per foot. Attention is called to the strict necessity of maintaining the ceiling heights posted on the architectural drawings.

1.06 VENT SYSTEMS

- A. Complete systems of ventilating pipes shall be installed from the various new plumbing fixtures and other equipment to which drainage connections are made.
 - 1. Ventilating pipes shall be connected to the discharge of traps as shown.
 - 2. Carry vents individually to a point above the ultimate overflow level of the fixtures before connecting with any other vent pipe; in general, this will be approximately 42" above the finished floor.
 - 3. Branches shall be arranged to pitch back to fixtures.
- B. Individual vent pipes shall be collected together in branch vent lines and connected to vent stacks in general, paralleling soil and waste stacks.

- 1. Wherever possible, vent stack offsets shall be connected to adjacent soil stacks for the purpose of draining condensation.
- 2. Where possible, the waste of a fixture shall be connected to the base of each vent stack for the purpose of washing out any scale or dirt which may accumulate.
- 3. The soil stack may be used to wash out the heel of the vent.
- C. Tops of all soil and waste stacks shall be extended as additional ventilating pipes.
 - 1. Pipes smaller than 4" size shall be increased to 4" by means of approved increasers before passing through the roof.
 - 2. The tops of all ventilating stacks shall collect together and run through the roof in series of larger pipes as shown on the drawings.

COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor and materials to complete the installation of the plumbing systems as shown on the drawings, specified herein or both as follows:
 - 1. System of sanitary waste and vent from each fixture to points of connection as indicated on the Plumbing drawings.
 - 2. Systems of hot and cold water distribution to all fixtures from mains where indicated.
 - 3. Fixtures as specified and/or indicated.
 - 4. Thermal insulation for all systems.
 - 5. Secure all required permits.
 - 6. Testing and adjusting of all systems.
 - 7. General Conditions of the contract.

GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SCOPE

- A. Provide shut-off valves to isolate sections of piping, every fixture and equipment. Valves shall be located at the inlet and outlet to permit removal for repairs without interfering with the remainder of the system.
- B. Do not locate valves with stems below horizontal. Provide ball, check, balancing cocks, plus air vents and other type of valves as required for complete and proper valving of the entire installation, to control flow, shut-off, prevent backflow, provide drainage, and control pressure and temperatures.
- C. Valves shall be as manufactured by Apollo, Nibco, Watts, Victaulic or Milwaukee Valve Co. and be of "lead-free" construction.

PART 2 PRODUCT

- 2.01 MATERIAL
 - A. Valves used for isolation and flow control in domestic water systems shall be bronze construction appropriate for potable water applications, equal to Watts LFB6000 Apollo 77 CLF-100/200 series or approved equal.
 - B. Check valves 2½" and less shall be bronze horizontal swing check, 125 swp, equal to NIBCO S-413-Y-LF. Check valves 3" and larger shall be iron body, bronze trim, 125 swp, equal to Nibco F-910-B-LF or approved equal.
 - C. Drain valves to be installed at low points in piping and as otherwise required to completely drain piping system and equipment. Drain valves shall be ball valves of size as shown or required, in no case smaller than ½" I.P.S., equal to Watts B-6000-CC, Apollo 70 HC series or approved equal with 3/4" male thread for hose, outlet with cap and chain.
 - D. Approved strainers shall be installed in the inlet connections to equipment and automatic control valves to protect all apparatus or any automatic character whose proper function would be interfered with by dirt on the seat or by scoring of the seat. Strainers shall be equal to Watts series LF 777 and LF77F-DI-125 or approved equal.
 - E. All valves shall be "lead free" construction and classified as such.
 - F. Valves used in LP gas lines for isolation shall be equal to Watts B-6000-UL-YSDT.

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE

- A. Address seismic restraints and hanging criteria as it applies within the existing facility. Seismic analysis, engineering and submission of a shop drawing package certified by a registered Professional Engineer for review by Owner representatives shall be the responsibility of this contractor. Review and approval of seismic restraint installations during the course of construction shall also be the direct responsibility of said engineer. Secure the services of a professional seismic consultant to review and design as required, plus administer construction/installations.
- B. Provide suitable and substantial hangers and supports for all horizontal and vertical lines as manufactured by B-Line, Allegheny Industrial, Tolco or ITT Grinnell.
- C. Support copper, steel, cast iron and all other material piping in accordance with the pipe manufacturer's published instructions, or the schedule below, whichever is more stringent.
- D. Support piping in accordance with the following schedule:

<u>Pipe Material</u>	Max. Horizontal Spacing	Max. Vertical Spacing	
Copper tubing 1¼" & smaller	6'	10'	
Copper tubing 1½" & larger	10'	10'	
Steel pipe	12'	15'	
Cast iron	At joint or 10'	At joint	
PVC & CPVC	As recommended by pipe manufacturer.		

E. Piping and equipment shall not be hung from the work of other trades.

PART 2 PRODUCT

- 2.01 MATERIAL
 - A. Hangers shall be of heavy construction suitable for the size of pipe to be supported. All materials, except pipe rollers, shall be wrought or malleable iron or steel. Hangers shall be adjustable type.
 - B. Hangers and pipe clamps used on copper piping shall be solid copper or copper plated. Where tube is in contact with dissimilar metal, protect with shield or plastic cover.
 - C. The intention is to provide supports which in each case shall be amply strong and rigid for the load, but which shall not weaken or unduly stress the building construction.
 - D. Hangers for pipes up to and including 4" shall be swivel ring, split ring, wrought pipe clamp, band, or adjustable wrought clevis type.
 - E. Hangers for pipes above 4" shall be standard clevis or roller.
 - F. For all insulated piping provide protective insulation shields MSS (Manufacturer's Standardization Society) Type 40 as follows:

<u>Pipe Size</u>	<u>Length</u>	<u>Thickness</u>	
1⁄4" to 31⁄2"	12"	18 ga.	
4"	12"	16 ga.	

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL

- A. Identification shall be provided on all piping that is exposed, as well as at all concealed locations such as shafts and above removable ceilings in which piping may be viewed.
 - 1. Furnish and affix approved adhesive bands/markers identifying the service and direction of flow of the various piping systems.
 - 2. A set of such bands/markers shall be affixed to each pipe not less than 30' and there shall be at least one set of identifying bands/markers in every room where piping may be viewed.
 - 3. Each set shall consist of one band/marker on which the name of the service is printed and one band/marker on which is printed a black directional arrow.
- B. Identification bands/markers shall have adhesive backing. Submit same for approval.
 - The name of the service shall be printed in keeping with ANSI/ASME A13.01 2007 standards for colors. The lettering shall not be less than 1¼" high for 3" pipe and larger; ¾" high for pipe 2½" and smaller.
 - 2. Bands/markers shall be applied where they can be read with their long dimension parallel to the axis of the pipe or duct. Bands shall be applied only after finish painting is completed.
- C. All existing pipe services currently void of identification that falls within the contract area shall be labeled as part of this contract. New labels shall be applied over existing insulation in cases where existing piping remains as is.
- 1.02 SCOPE
 - A. Attach to each valve a 2" brass tag on which shall be stamped designating letters and numbers 1/2" high filled with black enamel. Letters designate service.
 - 1. The tags shall be securely fastened to the handle or spindle of the valve by a brass chain.
 - 2. Cross reference valve tags on the "As-Built" drawings and include schedules in the Operation & Maintenance (O&M) manuals.
 - 3. One (1) copy of the valve schedule shall be provided in the O&M Manual. Review numbering with the Owner's representative prior to installation and honor any existing numbering systems in force today.
 - 4. The system of numbering for each service shall start with the number as directed by the RVCC Project Manager at the point of main service and progress throughout the contract area.
 - B. Provide nameplates for all equipment, motor starters, push button stations, pilot light stations or control points, and any other points in the building deemed necessary by the Owner's representative.
 - 1. Nameplates shall be fabricated from black bakelite with white recessed letters permanently secured with screws.
 - 2. Nameplate schedule and sample shall be submitted for approval.
 - C. Provide permanent labels on all pieces of plumbing equipment designating the unit tag as it is shown on plumbing drawings.

D. As part of the Owner Instruction session, review the location of valves, circulators and other specialties concealed above ceilings. Furnish and install adhesive dots on ceiling tiles (in the corner) for access reference.

Dot Colo	or
Blue	

<u>Service</u>

Domestic water

PART 2 PRODUCT 2.01 MATERIAL

A. Identification bands, tags, charts, and dots shall be as manufactured by Seton, Carlton or Brimar.

SCHEDULES FOR PLUMBING PIPING AND PUMPS

PART 1 GENERAL

1.01 MATERIALS - GENERAL

- A. Steel pipe shall be lap welded or seamless with maker's name rolled on each length equal to ASTM-A-53 of weight specified.
- B. Copper tube shall be seamless, hard, or soft equal to ASTM-B88 of type specified.
- C. Cast iron soil pipe shall be standard weight coated cast iron soil pipe. Each length shall bear the maker's name, weight per foot and size cast thereon. Fittings and traps shall be similarly marked. Cast iron pipe and fittings shall meet or exceed the requirements of CISPI 301 and 310.
- D. PVC pipe and fittings shall meet or exceed the requirements of ASTM D-1784 and 1785.
- E. CPVC pipe and fittings shall meet or exceed the requirements of ASTM D2846.
- F. Pumps used in potable water systems shall be bronze construction of manufacturer scheduled, or equal.

PART 2 PRODUCT

2.01 SCHEDULE OF PLUMBING PIPE MATERIALS

<u>Service</u> Domestic C.W., H.W. & R.H.W	<u>Location</u> All	<u>Size</u> All	<u>Material</u> Copper	<u>Type</u> Hard	<u>Weight</u> Type L
Sanitary Waste & Vent	Building	All	C.I.	No Hub	ASTM A 888
FC Condensate	All	All	PVC	DWV	Sch. 40

2.02 SCHEDULE OF PLUMBING PIPE FITTINGS

<u>Service</u> Domestic C.W., H.W. & R.H.W.	<u>Location</u> All	<u>Size</u> All	<u>Material</u> W. Copper	<u>Type</u> Soldered	<u>Weight</u> Lead-free
Sanitary Waste & Vent	Building	All	S/S Shld. & Clamp	No hub	ASTM A 888
FC Condensate	All	All	PVC	DWV	ASTM 2665

Piping Notes:

- 1. No solder containing lead shall be present on site.
- 2. DWV copper may be used for sanitary waste and vent services 2" and less in lieu of cast iron, except for urinal drains.
- 3. 3. "ProPress" Fittings or Victaulic copper couplings may be used in lieu of soldered connections in copper piping systems at this contractor's option

2.03 TRAPS

A. Traps shall be of material and type conforming to the piping system in which installed. Traps shall be of plain pattern, having a seal of not less than 2½", not greater than 4" except as noted on the drawings. All concealed 2" and larger traps shall be of the material specified for the piping system to which they are connected. All exposed fixture traps are to be as specified under the fixture schedule and or to match equipment tailpieces supplied by others.

2.04 CLEANOUTS

- A. Cleanouts for cast iron pipe shall consist of tapped extra heavy cast iron ferrule, caulked into the cast iron fittings, and extra heavy brass tapered screw plug with solid hexagonal nut. The cleanout plugs shall comply with the plumbing code and shall have American Standard pipe threads. Cleanouts turning out through wall and floors shall be made by long sweep ells or "Wye" fittings and 1/8 inch bends; into these caulk the following:
 - 1. At the heel of each vertical sanitary drain install a "Dandy" cleanout.
- B. Cleanouts in cast iron piping systems shall be Zurn models listed below, or of similar standard.
 - 1. Finished Floors ZN1400-BP
 - 2. Carpeted Floors ZN1400-BP-CM
 - 3. Unfinished Floors Z1400-BP
 - 4. Finished Walls Z-1441 or Z-1446

PART 3 EXECUTION

3.01 SOLDERING PIPE

- A. Fittings in copper tubing shall be wrought copper for sweat solder joints. Joints in copper water piping shall be made with solder, per schedule, and shall meet ASTM-B32-96AM. Flux shall be equal to Canfield's SOLDER-MATE and COPPER-MATE. No borax or alcohol mixtures or resin or similar paste fluxes shall be used. Care should be taken to see that no surplus flux is on the inside of the pipe when the joint is completed.
- 3.02 FIRE SEALANT
 - A. Fire sealing at all penetrations through rated general construction shall be in accordance with SECTIONS 07 84 00 AND 07 90 05.
 - B. Pipes passing through all masonry and fire rated gypsum board walls shall pass through clean cut holes fitted with Schedule 40 steel pipe sleeves, the inside diameter of which shall be at least 1" greater than the outside of the pipe passing through it. Pipes passing through non-rated gypsum board walls do not require sleeves, but the void between wall opening and pipe must be sealed and taped. Pipe insulation shall be continuous through sleeve/hole and all space between pipe and sleeve/hole shall be caulked full with product per SECTIONS 07 84 00 AND 07 90 05. Installation details shall be in accordance with the sealant manufacturer's published instructions in order to bear the UL Classification Marking.
 - C. Exposed pipes passing through walls, floors, partitions, or ceilings shall be fitted with chromium plated heavy gauge wrought brass escutcheons, fit snugly and securely held in place.
 - D. Pipes passing through fire rated floors shall be sealed in keeping with paragraphs A, B and D.
 - E. Sanitary vent pipes passing through roofs shall be provided with a manufactured "boot" for installation by the C.M.
 - F. PVC and CPVC pipe penetrations through fire rated general construction shall be firestopped with UL listed sleeve assemblies.
 - G. Submit firestopping product and details for review and approval. Coordinate product with the C.M. to assure project consistency. Provide a shop drawing by the fire sealant manufacturer that clearly identifies all products and applicable UL classification or listing.
 - H. Seal all pipe penetrations through, and system specialties in, general construction within the procedure room to prevent air leakage into and from the room. Review air sealing means,

methods, and materials with the C.M. to ascertain project requirements and standards prior to bid.

SCHEDULES FOR PLUMBING FIXTURES

PART 1 GENERAL

1.01 FIXTURES

A. Plumbing fixtures shall be as scheduled on the drawings and in accordance with RVCC Construction Standards.

PLUMBING INSULATION

PART 1 GENERAL

1.01 FIXTURES

- A. Provide all insulating materials required for piping, mechanical equipment, and sheet metal work. The execution of the work shall be by an experienced Insulation Contractor in strict accordance with the best practice of the trade and the intent of the specifications.
- B. Insulation thermal properties and thickness shall comply with the current state energy code: INTERNATIONAL ENERGY CONSERVATION CODE 2018 – Commercial Provisions.

PART 2 PRODUCT

2.01 MATERIAL

- A. Insulation shall be as manufactured by Owens-Corning Fiberglass Corp., Knauf, Johns-Manville Co., or approved equal.
- B. Insulating materials, jackets, adhesives, accessories, and applications shall develop a system having a UL rating with a flame spread of not over 25, a fuel contributed rating of not over 50 and a smoke developed rating of not over 50.
- C. Domestic Hot and Cold Water and Hot Water Recirculation piping (new and reinsulation of disturbed existing within the contract area): Cover with molded, heavy density fiberglass pipe insulation with ASJ/SSL. Adhere and seal end joint strips and overlap seams with proper mastic to provide continuous vapor barrier jacket. All fittings shall be insulated with precut fiberglass formed fittings with premolded PVC jacket mechanically fastened.

<u>Service</u>	Pipe Size	Insulation Thickness
CW	All	1/2"
HW & HW Recirc.	All	1"

D. Insulate water and drain lines under lavatories designated for use by the handicapped and all counter sinks with TRUEBRO "Lav-Guard 2", or equal by Plumberex, preformed insulation system (white).

COMMISSIONING OF PLUMBING

PART 1 GENERAL

1.01 COMMISSIONING OF SYSTEM(S)

A. The Plumbing Contractor shall be responsible for commissioning the installed Plumbing system(s) and demonstrating proper operation and functions at conclusion of the contract.

1.02 WATER SYSTEMS STERILIZATION

- A. Chlorination Method:
 - 1. Fill the system or any part thereof with a water solution containing 50 parts per million (ppm) available chlorine and let it stand for 24 hours before flushing and returning to service.
 - 2. During the chlorination process, all valves and accessories shall be operated.
 - 3. After chlorination, the water shall be flushed from the line at its ends until the replacement water when tested shall be found equal chemically and bacteriologically to tests of the permanent source of supply. Submit to the Owner's representative written verification that all procedures and tests, here specified, have been performed and that water at the building outlets on test will be found identical to the source water.
 - 4. Chlorination treatment shall not be performed where isolation from the existing domestic water piping system is not possible. In said case, thorough flushing shall be done.

1.03 PRESSURE TESTS

- A. All piping shall be pressure tested before being covered or concealed. This contractor shall provide all equipment necessary for said test.
- B. All tests shall be made in the presence of and to the satisfaction of the Owner's representative.
- C. The piping systems may be tested in sections as the work progresses, but no joint or portion of the system shall be left untested.
- D. All elements within the system that may be damaged by the testing operation shall be removed or other wise protected during the operation.
- E. All defects and leaks observed during the tests shall be corrected and made tight in an approved manner and the tests repeated until the system is proven tight.
- F. Repair all damage done to existing or adjacent work or materials due to or on account of the tests.
- G. All pressure piping shall be tested hydrostatically at a pressure of at least 1¹/₂ times the maximum operating pressure, but not less than 80 psi, for a two (2) hour duration with no drop in pressure.
- H. Soil, waste, vent, and storm systems shall be tested by filling systems with water from lowest point to highest point within the contract area. Water shall be allowed to stand for four (4) hours during which time there shall be no loss or leakage.

PLUMBING FIXTURES

PART 1 GENERAL

1.01 SCOPE

- A. All fixtures shall be free from imperfections, true to line, angles, curves, and color, smooth, watertight, and complete in every respect, and shall comply with RVCCI Construction Standards.
- B. Fixtures shall be as indicated in the schedule on the drawings. Fixtures are given as a typical standard and they, or their equal shall be furnished, set, and connected in a neat and workmanlike manner.
 - 1. All fixtures shall be set, connected, and tested.
 - 2. Make all water, waste, vent soil and other service connections to fixtures as indicated.
 - 3. Set, furnish, connect, and test all necessary fittings.
- C. Thoroughly clean all fixtures prior to final acceptance. All plated or polished fittings, pipes and appliances shall be coated with petroleum jelly immediately after installation and shall be highly polished and free from all marks and foreign substances as directed by the Architect.
- D. All fittings, escutcheons, faucets, traps, exposed piping, and the like shall be brass, chrome plated over nickel plate with polished finish.
- E. All hanger visible nuts shall likewise be chrome plated over nickel plate.
- F. Fixtures shall be as scheduled on the plumbing drawings, or an acceptable substitution.
- G. Fixture color shall be white (where applicable).

SECTION 23 00 00 – HEATING AND VENTILATING (H&V)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section describes heating and ventilating systems, quality expectations, materials and general requirements for construction.
- B. This contractor must be capable of acting as the general/prime contractor responsible for all construction means and methods, general conditions, permits, subcontractors, insurances, bonds and project accounting.

1.2 SYSTEMS DESCRIPTION

- A. H&V systems of this contract shall include:
 - 1. Exhaust Systems
 - 2. Fan Coil Units (FCU's)
 - 3. Piping, valves, hot water specialties and accessories
 - 4. Ducted Hot Water Heating Coils (HC's)
 - 5. Ductwork standards and sheet metal specialties
 - 6. Grilles, registers, diffusers & louvers
 - 7. Thermal insulation for all systems
 - 8. Testing and adjusting of all systems
 - 9. Control systems and specialties
 - 10. General Conditions of the contract
 - 11. Miscellaneous items
 - 12. Secure all required permits

1.3 RELATED DIVISIONS and SECTIONS

- A. DIVISION 25 Integrated Automation
- B. DIVISION 26 Electrical

1.4 REFERENCES

- A. 2018 International Building Code with State of NH Amendment
- B. 2018 NFPA 101, Life Safety Code with State of NH Amendments
- C. New Hampshire State Fire Code Saf-C6000
- D. 2018 NFPA 1, Fire Prevention Code with State of NH Amendments
- E. 2018 International Plumbing Code with State of NH Amendments

- F. 2018 International Mechanical Code with State of NH Amendments
- G. 2018 International Energy Conservation Code with State of NH Amendments
- H. 2020 National Electric Code with State of NH Amendments
- I. City of Claremont prevailing ordinances, rules and regulations
- J. City of Claremont Fire Department(s) rules and regulations
- K. All applicable ASTM Standards.

1.5 SUBMITTALS

- A. Submittals for all H&V equipment, piping, insulation and other system components, as well as accessories and specialties, shall be submitted as PDF's for review and approval.
- B. The Contractor shall be responsible for maintaining an organized log of submittals, including a Table of Contents that shall form part of the Owner's Manual at project completion.
- C. Ordering of equipment and materials for installation shall not proceed without an approved submittal.
- D. As-Built documentation and Testing & Balancing reports shall be considered submittals and included as part of the Owner's Manual at project completion.

1.6 HVAC EQUIPMENT

- A. Heating and ventilating equipment provided as part of this contract, in particular the fan coil units shall be as scheduled on the drawings. Equipment orders shall include all standard features and accessories noted on the drawings. Proposed substitutions must be equivalent to the specified equipment with respect to construction details and electrical characteristics where applicable.
- B. Contractors shall visit the specified equipment manufacturer's web site for exact specifications, construction details and operating characteristics.

SECTION 23 01 00 – OPERATION AND MAINTENANCE OF H&V SYSTEMS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. Provide all items, articles, materials, operations, or methods listed, mentioned, scheduled on the drawings and/or specified herein including all labor, materials, equipment and incidentals necessary and required for completion of this contract.

1.2 INTENT

- A. The intent of the specifications and drawings is to call for finish work, tested and ready for operation.
- B. Any apparatus, appliance, material or service not specified or indicated, but necessary to make the work complete and perfect in all respects and ready for operation shall be provided.
- C. The drawings are generally diagrammatic, intended to convey the scope of work and indicate the general arrangement of equipment and piping, plus approximate size and locations of equipment.

1.3 WORKMANSHIP

- A. All work shall be executed in the best and most thorough manner under the direction of, and to the satisfaction of, the Owner's representative.
- B. This contractor shall, at all times, keep a competent foreman in charge of the work and shall facilitate inspection of installations by the Owner's representative.

1.4 RULES, REGULATIONS, PERMITS AND FEES

- A. All work shall comply with applicable portions of all state or local laws, ordinances, rules and regulations.
- B. Nothing contained in these specifications or indicated on the drawings shall be construed to conflict with applicable portions of any laws, ordinances, rules and regulations.
 - 1. All pressure vessels shall be furnished and installed in strict accordance with the applicable regulations of the state and the ASME codes and shall be equipped with all appurtenances required by the aforesaid codes.
- C. All required permits and fees relative to this Division shall be obtained and paid for by this contractor.

1.5 OPERATING AND MAINTENANCE MANUAL

- A. In accordance with DIVISION 1 GENERAL REQUIREMENTS, manufacturer's printed operating and maintenance instructions for each piece of equipment furnished under DIVISION 23.
- B. Each manual shall be suitably and neatly marked to identify the particular equipment furnished and shall include lubricating charts.
- C. All instructions and charts shall be bound in appropriate cover binders properly indexed, identified, and titled to provide three (3) complete manuals.
- D. Completed manuals shall be submitted for review. After approval, the manuals shall become property of the Owner.

1.6 OWNER INSTRUCTION

- A. This contractor and suppliers, if necessary, shall thoroughly instruct the Owner's representative and maintenance personnel in the proper maintenance and operation of materials and systems installed under this Division, as follows:
 - 1. Detailed written instructions shall be provided for all mechanical systems, including but not limited to:
 - a. Winter shut-down, spring start-up of systems, if applicable.
 - b. Heating fuel conversion, if applicable.
 - c. All other operations that, if improperly performed, might endanger the building's occupants or damage the building's equipment or contents.
 - 2. Sessions shall be held at the completed facility to instruct the Owner in the proper operation, cleaning, lubricating and maintenance of all mechanical systems, as well as water systems chemical treatment.

1.7 AS-BUILT DOCUMENTS

A. During construction, Contractor shall keep an up-to-date, redlined, marked set of Progress As-Built Drawings and Specifications on the Site. As a condition precedent to Final Completion, Contractor shall deliver to Owner the Record As-Built Drawings and Specifications which shall include delivery of final as-built drawing in full size, hard copy format, and in fully operable and editable native format in the latest commercially available version of AutoCAD.

SECTION 23 05 00 - COMMON WORK RESULTS FOR H&V

PART 1 - GENERAL

1.1 INTENT

- A. Furnish all labor and materials to complete the installation of the H&V systems as shown on the drawings, specified herein, or both as follows:
 - 13. Exhaust Systems
 - 14. Fan Coil Units (FCU's)
 - 15. Piping, valves, hot water specialties and accessories
 - 16. Ducted Hot Water Heating Coils (HC's)
 - 17. Ductwork standards and sheet metal specialties
 - 18. Grilles, registers, diffusers & louvers
 - 19. Thermal insulation for all systems
 - 20. Testing and adjusting of all systems
 - 21. Control systems and specialties
 - 22. General Conditions of the contract
 - 23. Miscellaneous items
 - 24. Secure all required permits

SECTION 23 05 16 – EXPANSION FITTINGS AND LOOPS FOR H&V PIPING

PART 1 - GENERAL

- 1.1 SCOPE
 - A. Expansion compensators shall be as manufactured by NAI, Keflex, Victaulic, Southeastern Hose, Inc. or Mason Industries and sized for expansion indicated or required.
 - B. Anchors shall be designed to suit job conditions and located where indicated on drawings or directed.
 - C. Expansion joints, loops and anchors shall be provided as required to control expansion and allow pipes to move from anchor points to expansion points.
 - D. Refer to SECTION 23 05 29 for further information and requirements relative to this Section.

SECTION 23 05 17 - SLEEVES AND SLEEVE SEALS

PART 1 - GENERAL

1.1 SCOPE

- A. Schedule 40 steel sleeves shall be used at pipe penetrations through masonry walls and galvanized steel sleeves through gypsum board or other framed walls/partitions.
- B. All sleeves shall be fire-sealed in keeping with the project standards.
- C. Link-Seal modular seals, or equal, shall be used as concrete/masonry foundation wall, floors and/or roof penetrations, installed in strict accordance with the manufacturer's recommendations.
- D. Fire-sealing and sleeve details shall be submitted for review and approval in advance of construction. Fire-sealing at all penetrations through rated general construction shall be in accordance with prevailing codes and best trade practices.
- E. Coordinate fire-sealing "project standards" and products with all sub-contractors to assure uniformity.

SECTION 23 05 23 – GENERAL-DUTY VALVES FOR H&V PIPING

PART 1 - GENERAL

1.1 SCOPE

- A. Provide shut-off valves to isolate sections of piping, every fixture and equipment. Valves shall be located at the inlet and outlet to permit removal for repairs without interfering with the remainder of the system.
- B. Do not locate valves with stems below horizontal. Provide ball, check, balancing cocks, plus air vents and other type of valves as required for complete and proper valving of the entire installation, to control flow, shut-off, prevent backflow, provide drainage and control pressure and temperatures.
- C. Valves shall be as manufactured by Watts, Apollo, Nibco, Victaulic, Anvil International, Grinnell or Milwaukee Valve Co.

PART 2 - PRODUCT

2.1 MATERIAL

- A. HWS&R 2" and smaller Ball valves for flow control and/or tight shut-off shall be all bronze construction, full port brass ball with hard chrome plating, 150 swp, with blow-out-proof stem design, equal to Apollo 77 Series, Watts or Nibco or approved equal.
- B. HWS&R 2½" and larger Butterfly valves for flow control and/or tight shut-off shall be 200 psi, C.I. body, S.S. stem, equal to Watts DBF or Victaulic Vic-300 or approved equal.
- C. Check valves 2¹/₂" and less shall be bronze horizontal swing check, 125 swp, equal to Nibco T-413-B. Check valves 3" and larger shall be iron body, bronze trim, 125 swp, equal to Nibco F-918-B or approved equal.
- D. Drain valves to be installed at low points in piping and as otherwise required to completely drain piping system and equipment. Drain valves shall be ball valves of size as shown or required, in no case smaller than ½" I.P.S., equal to Watts Series B-6000-CC, Apollo 70HC Series or approved equal with ¾" male thread for hose, end outlet with cap and chain.
- E. Where manual balancing valves are indicated, furnish and install Macon Balancing "globe style" Model STV/L for sizes ½" thru 2" and Model STVA for 2½" thru 6" or equal by Tour Andersson. Valves shall be tight shut-off and sized for GPM as recommended by the manufacturer.

- F. Approved strainers shall be installed in the inlet connections to equipment and automatic control valves to protect all apparatus or any automatic character whose proper function would be interfered with by dirt on the seat or by scoring of the seat. Strainers shall be equal to Watts series 777 and 77F-D or approved equal.
- G. Pressure reducing valves for water shall be of anti-siphon check type with built-in strainer equal to Watts U5B and N223BS or approved equal.
SECTION 23 05 29 – HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Provide suitable and substantial hangers and supports for all horizontal and vertical lines as manufactured by B-Line, Allegheny Industrial or an acceptable alternative.
- B. Support copper, steel, cast iron, and PVC piping in accordance with the pipe manufacturer's published instructions, or the schedule below, whichever is more stringent.
- C. Support piping in accordance with the following schedule:

Pipe Material	Max. Horizontal Spacing	Max. Vertical Spacing
Copper tubing 11/4" & smalle	g 6' r	10'
Copper tubing 11/2" & larger	g 10'	10'
Steel pipe	12'	15'
Cast Iron	At joint or 10'	At joint
PVC	As recommended by pipe manufacturer.	

- D. Piping, ductwork and equipment shall not be hung from the work of other trades.
- E. Hang and support ductwork in accordance with SMACNA standards and best trade practices.
- F. For equipment mounted outside of the building, calculate forces developed by 30 psf wind loads for the attachment of supports.

PART 2 - PRODUCT

2.1 MATERIAL

- A. Hangers shall be of heavy construction suitable for the size of pipe to be supported. All materials, except pipe rollers, shall be wrought or malleable iron or steel. Hangers shall be adjustable type.
- B. Hangers and pipe clamps used on copper piping shall be solid copper or copper plated. Where tube is in contact with dissimilar metal, protect with shield or plastic cover.

- C. The intention is to provide supports which in each case shall be amply strong and rigid for the load, but which shall not weaken or unduly stress the building construction.
- D. Hangers for pipes up to and including 4" shall be swivel ring, split ring, wrought pipe clamp, band, or adjustable wrought clevis type.
- E. Hangers for pipes above 4" shall be standard clevis or roller.
- F. Corrosion protection for vibration isolators for outdoor applications shall be as follows:
 - 1. Hardware shall be cadmium or zinc plated, all other metal parts shall be hot dipped galvanized or zinc electroplated.
 - 2. All hangers shall be capable of withstanding three times the rated load without failure.
- G. Furnish and install shields and blocks to protect insulation and maintain thickness integrity at hanger rest points.
- H. For piping ≥ 3" provide Teflon slide type supports MSS (Manufacturer's Standardization Society) Type 35 or protective saddles MSS Type 39. For insulated piping, fill interior voids of saddles with segments of insulation to match adjoining pipe insulation.
- I. For all insulated piping provide protective insulation shields MSS (Manufacturer's Standardization Society) Type 40 as follows:

Pipe Size	Length	<u>Thickness</u>
1⁄4" to 31⁄2"	12"	18 ga.
4"	12"	16 ga.

END OF SECTION 23 05 29

SECTION 23 05 48 – VIBRATION ISOLATION AND SEISMIC CONTROLS FOR H&V PIPING AND EQUIPMENT

PART 1 - GENERAL

- 1.1 Scope
 - A. All mechanical piping, ductwork and equipment shall be constructed and installed to resist seismic forces per the International Building Code and State of New Hampshire requirements.
 - B. Seismic analysis, engineering and submission of a shop drawing package certified by a registered Professional Engineer for review by Owner's representatives shall be the responsibility of this Contractor. Review and approval of seismic restraint installations during the course of construction shall also be the direct responsibility of said engineer.

END OF SECTION 23 05 48

SECTION 23 05 53 – IDENTIFICATION FOR H&V EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Identification shall be provided on all piping that is exposed, as well as at all concealed locations such as crawl spaces, service tunnels, shafts and above removable ceilings in which piping may be viewed. This applies for all new and existing piping for this contract.
 - 1. Furnish and affix approved adhesive bands/markers identifying the service and direction of flow of the various piping systems.
 - 2. A set of such bands/markers shall be affixed to each pipe not less than 30' and there shall be at least one set of identifying bands/markers in each room where piping may be viewed.
 - 3. Each set shall consist of one band/marker on which the name of the service is printed and one band/marker on which is printed a black directional arrow.
- B. Identification bands/markers shall have adhesive backing. Submit same for approval.
 - 1. The name of the service shall be printed in keeping with ANSI/ASME A13.1 2007 Standards for Color. The lettering shall not be less than 1¹/₄" high for 3" pipe and larger; ³/₄" high for pipe 2¹/₂" and smaller.
 - 2. Bands/markers shall be applied where they can be read with their long dimension parallel to the axis of the pipe or duct.
 - 3. Bands/markers shall be applied only after finish painting is completed.
- C. Attach to each valve a 2" brass tag on which shall be stamped designating letters and numbers ½" high filled with black enamel. Letters designate service.
 - 1. The tags shall be securely fastened to the handle or spindle of the valve by a brass chain.
 - 2. Furnish four (4) schedules of valves so tagged, mounted in the Operation & Maintenance (O&M) manuals.
 - 3. One (1) copy of such schedules shall be mounted in glazed frames located in the Mechanical Room or where directed by the Owner's representative. Review numbering with the Owner's representative prior to installation and honor any existing numbering systems in force today.
 - 4. The system of numbering for each service shall start with the No. 1 beginning at the point of main service and progress throughout the contract area.
- D. Provide nameplates for all equipment, motor starters, push button stations, pilot light stations or control points, and any other points in the building deemed necessary by the Owner's representative.
 - 1. Nameplates shall be fabricated from black bakelite with white recessed letters permanently secured with screws.
 - 2. Nameplate schedule and sample shall be submitted for approval.

- 3. Coordinate identification of exhaust fan switches provided by the Electrical Contractor.
- E. Provide permanent labels on all pieces of mechanical equipment designating the unit tag as it is shown on mechanical drawings.
- F. As part of the Owner Instruction session, review the location of valves, circulators, dampers and other specialties concealed above ceilings. Furnish and install adhesive dots on ceiling tiles (in the corner) for access reference.

Dot Color	<u>Service</u>
Red	Heating
Green	Air-side specialty

PART 2 - PRODUCT

2.1 MATERIAL

A. Identification bands, tags, charts and dots shall be as manufactured by Seton, Carlton or Brimar.

END OF SECTION 23 05 53

SECTION 23 05 93 – TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 TESTING AND BALANCING

- A. Procure the service of an independent Testing and Balancing Agency that specializes in the testing and balancing of heating and ventilating systems.
- B. Both air and water systems shall be done by the same agency.
- C. Work shall not begin until the agency has been notified in writing that all systems have been completed, cleaned and placed in full working sequence by this contractor. Clean filters shall be installed by this contractor prior to start of balancing work.
- D. Test, balance and adjust all air moving equipment, terminals, supply, return and exhaust systems. Work together with the ATC Contractor to adjust setpoints of out-side/return/exhaust dampers where applicable.
- E. Test, balance and adjust all water systems to provide scheduled flows to all terminals and eliminate noise.
- F. When all control systems and preliminary testing and balancing are complete, this contractor, with the cooperation of the ATC Contractor, shall perform an independent test of all systems for specified sequences of operation.
 - 1. The test shall include all operations as specified in "Sequences of Operation" note on the mechanical drawings.
 - 2. All dampers, valves, and similar appurtenances shall be visually or physically confirmed to operate as specified. Operating and safety devices such as aquastats and freezestats shall be verified operational.
 - 3. All interlocks between equipment shall be confirmed to operate as specified.
 - 4. This contractor shall provide the ATC Contractor with operating setpoints as well as alarm setpoints such as dirty filters, high/low limits, etc., as required.
 - 5. Report findings per J. below.
- G. Perform all tests in accordance with standard procedures such as those outlined by the Associated Air Balance Council (AABC) and/or Sheet Metal and Air Conditioning Contractors National Association, Inc., (SMACNA).
- H. At completion of all testing and balancing, leave all equipment systems, components, etc., adjusted within the limits of installed equipment and to within 10% of design requirements. Mark all setpoints of all dampers and valves with distinguishing marks. If requested, conduct tests in the presence of the Owner's representative.
- I. Within 15 days after completion of testing and balancing, submit for review six (6) copies of the testing and balancing results on industry recognized forms. Include a warranty period of 90 days during which time the Owner's representative may request recheck or re-adjustment of any part of the job.

- J. All reports shall clearly indicate the following minimum information:
 - 1. Air System name, rated and actual HP, BHP, motor nameplate efficiency, voltage, amperage, fan rpm, suction, discharge and total static pressures, total system flow rate, (system traverse), individual terminal flow rates. Terminal readings must show location, make, model and size of register, grille, or diffuser. Include a static pressure profile of all ERU's and AHU's components.
 - 2. Water Pump full flow and no flow suction and discharge pressures, rated and actual amoerage, HP, BHP, motor nameplate efficiency, voltage and total dynamic head. Calibrated balancing devices readings shall indicate location, size, setting, differential pressure, and rated and actual GPM.
 - 3. ATC Sequence Check: Report shall include a paragraph-by-paragraph review of the sequence of controls specification, noting either "operates as specified", or detailing any deviations or deficiencies.
 - a. Should the H&V systems be found incomplete or not performing per specification, the ATC Contractor shall correct deficiencies and the Testing and Balancing Subcontractor shall recheck until all sequences have been verified proper.

END OF SECTION 23 05 93

SECTION 23 06 20 – SCHEDULES FOR H&V PIPING AND PUMPS

PART 1 - GENERAL

- 1.1 MATERIALS GENERAL
 - A. Steel pipe shall be lap welded or seamless with maker's name rolled on each length equal to ASTM-A-53 of weight specified.
 - B. Copper tube shall be seamless, hard or soft equal to ASTM-B88 of type specified.
 - C. PVC pipe and fittings shall meet or exceed the requirements of ASTM D-1784 and 1785.
 - D. Pumps shall be of capacity and manufacturer scheduled on the drawings and as specified hereinafter.

PART 2 - PRODUCT

2.1 SCHEDULE OF PIPE MATERIALS

<u>Service</u>	Location	<u>Size</u>	<u>Material</u>	Type	<u>Weight</u>
HWS&R	All	2" & Smaller	Steel or Copper	Screwed or Soldered	Sched. 40 Type L
HWS&R	All	2 ½" & Larger	Steel	Flanged or Welded	Sched. 40
LP Gas	All	All	Steel	Threaded or Welded	Sched. 40

2.2 SCHEDULE OF PIPE FITTINGS, FLANGES & VALVES

<u>Service</u>	Location	<u>Size</u>	Material	Type	Weight
HWS&R	All	2" & Smaller	Steel or W. Copper	Screwed or Soldered	150# Lead-free
HWS&R	All	2 ½" & Larger	Steel	Flanged or Welded	150#
LP Gas	All	All	Steel	Threaded or Welded	150#

PART 3 - EXECUTION

3.1 INTENT

- A. Furnish and install all mechanical work of this contract in accordance with governing codes and in a workmanlike manner.
- B. The run and arrangement of all pipes shall be approximately as shown on the drawings and as directed during installation and shall be as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and be neatly spaced.
- C. Arrange work to avoid all interference with the work of all other trades. Consult with other contractors, and coordinate the location of their work with that of the others.

3.2 GENERAL INSTALLATION OF PIPING

- A. All piping shall be properly supported or suspended on stands, clamps, hangers and the like, in accordance with sections 230529 and 230548.
 - 1. Supports shall be designed to permit free expansion and contraction while minimizing vibration.
- B. Screw threads shall be cut clean and true. Bushings shall not be used.
 - 1. All reductions shall be made with eccentric reducers or eccentric fittings.
 - 2. All pipe two inch (2") or less shall be reamed after cutting to remove all burrs.
- C. The drawings indicate generally the size and location of piping, and while sizes must not be decreased, the right is reserved for Owner's representative to change runs and sizes of pipes in order to accommodate conditions on the job.
 - 1. Any pipes not indicated on the drawings shall be sized as directed and run where directed by the Owner's representative.
- D. Piping shall be properly graded to insure easy circulating and prevent noise and water hammer. Water piping shall pitch upward in the direction of flow, except the water piping located above finished ceilings which may be run level.
 - 1. Proper provision shall be made for expansion and contraction in all portions of pipe work to prevent undue strain on piping, fixtures or apparatus connected therewith.
- E. Vent all high points and drain all low points in water systems as required to achieve perfect water circulation.
- F. Take runouts off top of mains at 45° or 90° angle with at least one swing joint between riser or stub and main.
- G. For change in horizontal piping size use eccentric reducer coupling with bottom of coupling horizontal.

3.3 PIPE JOINTS AND FITTINGS

- A. Fittings for use on steel pipe shall be screwed iron or welded fittings of type and weight as scheduled. For hot water services, mechanical fittings and joining systems may be used. Gaskets used in the mechanical couplings must be compatible and rated for intended service with respect to pressure and water system inhibitors or glycol.
- B. Flanges on steel pipe shall be screwed cast iron or welded type of weight to match the piping on which installed. For hot water services mechanical fittings and joining systems may be used.
- C. Dissimilar pipe materials (copper to steel, etc.) shall be joined with an approved dielectric fitting or brass coupling.
- D. Flexible metal hose connectors shall be as manufactured by Victaulic or equal.

3.4 WELDING AND SOLDERING PIPE

- A. Welded joints, outlets and flanges shall be used as shown on drawings, specified or directed. Welded joints may also be provided elsewhere at this Contractor's option except on piping smaller than 2½", or at points where it may be explicitly specified or directed to leave flanged joints in order to facilitate future changes.
- B. All welded joints (except pipe welded end to end) shall be made by use of forged onepiece welding flanges caps, nozzles, elbows, branch outlets and tees, equal to WELDBEND.
 - 1. All such fittings shall be of a type which maintains full wall thickness at all points, ample radius and fillets, and proper bevels or shoulders at ends.
 - 2. Wel-o-lets or Thread-o-lets may be used where standard fittings or required sizes are not available and elsewhere approved.
- C. All job welding shall be done by the electric arc welding process.
 - 1. All welding shall be done in accordance with the welding procedures of the National Certified Pipe Welding Bureau or other approved procedure, conforming to the requirements of the ASME Boiler and Pressure Vessel Code or the ASA Code for Pressure Piping.
- D. All piping 2¹/₂" size and larger shall be butt welded with welded fittings. Stub welding shall not be permitted.
- E. Fittings in copper tubing shall be wrought copper for sweat solder joints. Joints in copper water piping shall be made with solder, per schedule, and shall meet ASTM-B32-96AM. Flux shall be equal to Canfield's SOLDER-MATE and COPPER-MATE. No borax or alcohol mixtures or resin or similar paste fluxes shall be used. Care should be taken to see that no surplus flux is on the inside of the pipe when the joint is completed.

3.5 FIRE SEALANT

- A. Pipes passing through all masonry and fire rated gypsum board walls shall pass through clean cut holes fitted with steel pipe sleeves, the inside diameter of which shall be at least 1" greater than the outside of the pipe passing through it. Pipes passing through non-rated gypsum board walls do not require sleeves, but the void between wall opening and pipe must be sealed and taped. Where UL approved for the application, pipe insulation shall be continuous through sleeve/hole, and all space between pipe and sleeve/hole shall be caulked full with product per prevailing fire codes. Installation details shall be in accordance with the sealant manufacturer's published instructions in order to bear the UL Classification Marking.
- B. Exposed pipes passing through walls, floors, partitions or ceilings shall be fitted with finish escutcheons, fit snugly and securely held in place.
- C. Ducts passing through rated walls shall be caulked with a minimum of 1¼" thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a minimum ¼" diameter bead of caulk shall be applied at the wallboard/duct interface on both surfaces of wall assembly. Void fill material must bear the UL Classification Marking and installation details shall be in accordance with the sealant manufacturer's published instructions in order to bear the UL Classification Marking.
- D. Pipes and ducts passing through fire rated floors shall be sealed in keeping with paragraphs A and B.
- E. PVC and CPVC pipe penetrations through fire rated general construction shall be firestopped with UL listed sleeve assemblies.
- F. Submit firestopping product and details for review and approval. Coordinate product all sub-contractors to assure project consistency. Provide a shop drawing by the fire sealant manufacturer that clearly identifies all products and the applicable UL classification or listing for penetrations applicable to the project.

END OF SECTION 23 06 20

SECTION 23 07 00 – PIPE INSULATION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all insulating materials required for piping and mechanical equipment. The execution of the work shall be by an experienced Insulation Contractor in strict accordance with the best practice of the trade and the intent of the specifications.
- B. Insulation thermal properties and thickness shall comply with the current state energy code: 2018 IECC Commercial Provisions.

PART 2 - PRODUCT

2.1 MATERIAL

- A. Insulation shall be as manufactured by Owens-Corning Fiberglass Corp., Knauf, Johns- Manville Co., or approved equal.
- B. Insulating materials, jackets, adhesives, accessories and applications shall develop a system having a UL rating with a flame spread of not over 25, a fuel contributed rating of not over 50 and a smoke developed rating of not over 50.
- C. Hot Water Supply & Return piping: Cover all (new and existing piping within the contract area) with molded, heavy density fiberglass pipe insulation with ASJ/SSL. Adhere and seal end joint strips and overlap seams with proper mastic to provide continuous vapor barrier jacket. All fittings shall be insulated with precut fiberglass formed fittings with pre-molded PVC jacket mechanically fastened, including unions, couplings, flanges and air separators where applicable.

<u>Service</u>	Pipe Size	Insulation Thickness
HWS&R	1 ¼" & Smaller	1 1⁄2"
HWS&R	1 ½" & Larger	2"

D. Insulate exposed piping (new & existing) and pipe drops to heating terminals subject to physical abuse per C. of the Section and cover entire length with protective PVC jacket (white).

PART 3 – EXECUTION

3.1 INSTALLATION

A. All insulation systems on piping networks shall be applied in strict accordance with the insulation manufacturer's published instructions.

END OF SECTION 23 07 00

SECTION 23 07 13 – DUCT INSULATION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all insulating materials required for mechanical equipment. The execution of the work shall be by an experienced Insulation Contractor in strict accordance with the best practice of the trade and the intent of the specifications.
- B. Insulation thermal properties and thickness shall comply with the current state energy code: 2018 IECC Commercial Provisions.

PART 2 - PRODUCT

2.1 MATERIAL

- A. Insulation shall be as manufactured by Owens-Corning Fiberglass Corp., Knauf, Johns-Manville Co., or approved equal.
- B. Insulating materials, jackets, adhesives, accessories and applications shall develop a system having a UL rating with a flame spread of not over 25, a fuel contributed rating of not over 50 and a smoke developed rating of not over 50.
- C. Insulate all (new and reinsulation of disturbed existing within the contract area) ductwork to exterior louvers with 2-1/3" foil faced .75 PCF (R = 6.0) fiberglass insulation. Insulate all ductwork located in cold attic spaces with 3" foil faced .75 PCF (R = 8.3) fiberglass insulation. Insulation shall be wrapped tightly on ductwork with all circumferential joints butted together and longitudinal joints overlapped 2". Staple longitudinal joints securely and foil tape all joints airtight. Ductwork shown to be acoustically lined does not have to be wrapped.
- D. Acoustic lining shall be 1" thick flexible closed cell duct liner. Lining shall meet the Life Safety Standards of NFPA 90A, NFPA No. 101 Class A Rating, UL 94-5V Flammability Classification and shall meet the requirements of ASTM E96, ASTM D1056, ASTM D1171 and UL 181 for resistance to microdial growth and air erosion. Dimensions of lined duct on the drawings are the inside dimensions of the duct after the lining has been installed. Product shall be IMCOA IMCOSHEET or K-Flex, GREENGUARD certified. Duct lining shall be adhered to metal duct with full coverage of a fire retardant adhesive, as recommended and/or supplied by the manufacturer. Install liner and adhesive in strict accordance with the manufacturer's published instructions including proper cleaning of ductwork. Traverse joints shall be compression fit and butted without gaps. All leading edges shall be installed with metal nosings.
- E. Exterior (outdoor) ductwork shall be insulated with 2 ½" thick (R = 12) polyisocyanurate rigid insulation and cover with Alumaguard 60[™] White rubberized bitumen membrane. The insulation and vapor barrier membrane shall be installed in strict accordance with the manufacturer's published instructions.

END OF SECTION 23 07 13

SECTTION 23 08 00 – COMMISSIONING OF H&V SYSTEMS

PART 1 - GENERAL

1.1 COMMISSIONING OF SYSTEM(S)

A. The Mechanical Contractor shall be responsible for commissioning the installed H&V system(s) and demonstrating proper operation and functions at conclusion of the contract.

1.2 PRESSURE TESTS

- A. All piping shall be pressure tested before being covered or concealed. This contractor shall provide all equipment necessary for said test. All tests shall be recorded on a log sheet, noting piping section tested, initial and final pressures, duration of test and date of test.
- B. All tests shall be made in the presence of and to the satisfaction of the Owner's representative. Provide a copy of all test log sheets to the Owner's representative upon completion of testing.
- C. The piping systems may be tested in sections as the work progresses, but no joint or portion of the system shall be left untested.
- D. All elements within the system that may be damaged by the testing operation shall be removed or otherwise protected during the operation.
- E. All defects and leaks observed during the tests shall be corrected and made tight in an approved manner and the tests repeated until the system is proven tight.
- F. Repair all damage done to adjacent work or materials due to or on account of the tests.
- G. All pressure piping shall be tested hydrostatically at a pressure of at least 1¹/₂ times the maximum operating pressure, but not less than 80 psi, for a two (2) hour duration with no drop in pressure.

1.3 SYSTEMS FLUSHING

- A. For the hot water system, extreme caution shall be exercised by contractor to prevent dirt and other foreign matter from entering pipes or components of system during construction. Pipe stored on project shall have open ends capped and equipment shall have all openings fully protected. Before erection, each piece of pipe, fitting or valve shall be visually examined and all dirt removed.
- B. With the system filled with clean water, circulation established and trapped air vented, the boiler plant shall be energized. Any leaks in piping shall be repaired before proceeding with further test procedures. Low point drains in the system shall be

opened for initial flush and blowdown, with town water fill valves set to make up water at an equal rate. Check pressure gauge at pump suction and manually adjust makeup water to maintain steady positive pressure before and after opening drain valves. Flushing shall continue until clean water is evident leaving open drains. In no case shall the flushing period be less than two hours. Upon completion of flushing, all strainers shall be removed, cleaned and reinstalled.

- C. After initial system flushing, chemically clean the hot water piping system in accordance with best trade practices and recommendations offered by the Owner's water treatment contractor.
- D. After said cleaning procedure, the systems shall then be drained completely and refilled with fresh water.
- E. After systems have been completely cleaned, they shall be tested by an independent agency and left on the slightly alkaline side (pH 7.05). If systems are still on the acidic side, cleaning by use of trisodium phosphate shall be repeated. Submit certified test results to the Owner's representative for record.
- F. Inhibitors shall be introduced to the hot water piping system as specified hereinafter and/or as directed by the Owner's water treatment contractor.
- G. Refer to spec. section 232500 for H&V water treatment and additional system flushing requirements.

1.4 AUTOMATIC TEMPERATURE CONTROLS (ATC) SEQUENCE CHECK

- A. This contractor shall be responsible for the scheduling and coordination of subcontractors, specifically the Testing and Balancing Subcontractor and ATC Subcontractor, for the performance of an ATC sequence check on all H&V systems.
 - 1. ATC installation and preliminary testing and balancing shall be complete prior to the scheduling of the ATC sequence check.
- B. This contractor shall notify the engineer 48 hours prior to the scheduled performance of the ATC sequence check.

END OF SECTION 23 08 00

SECTION 23 20 00 – H&V PIPING, PUMPS AND SPECIALTIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. H&V piping shall be as scheduled in SECTION 23 06 20.

1.2 SCOPE

A. Furnish all hot water equipment and specialties of configuration, model and manufacturer indicated on the drawings or as specified hereinafter.

PART 2 - PRODUCT

2.1 SPECIALTIES

- A. Manual Air Venting Devices:
 - 1. For hot water terminals (unless otherwise shown on drawings), provide manual air vents. Air vents shall be quarter turn open ¼" ball cocks with extended drain line, located to permit easy use.
- B. Pressure relief valves shall be ASME rated for pressure and duty intended.
- C. Furnish and install expansion tank(s), air separator(s) and automatic air vents of capacity shown on plans.

END OF SECTION 23 20 00

SECTION 23 31 00 – DUCTWORK AND ACCESSORIES

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all ductwork, grille boxes, plenum chambers, dampers, and all auxiliary work of any kind necessary to make the various air handling systems of the building complete and ready for satisfactory operating. All ductwork shall be constructed in accordance with SMACNA Standards for the applicable pressure classification.
- B. Ductwork shall be shipped to the site sealed with tape and plastic. Throughout construction, all open end supply/return air ductwork and terminals shall be sealed with tape and plastic until the building is free of dust. No air handling equipment shall be operated until the building is clean.

PART 2 - PRODUCT

- 2.1 MATERIAL
 - A. Rectangular Low Pressure and Medium Pressure Ductwork:
 - 1. Ductwork, except where otherwise specified, shall be made of the best grade galvanized iron, constructed in accordance with the recommendations of the ASHRAE Guide, and SMACNA Guide, latest edition.
 - 2. Volume dampers shall be furnished and installed as shown or required for balancing the systems. Dampers operators shall be of the quadrant type provided with approved operating and locking device mounted outside the duct in accessible location. Install handles to indicate position of damper blades.
 - 3. Ductwork layouts as shown on the drawings shall be adhered to as closely as possible, however, the right is reserved to vary the runs and sizes of ductwork and to make offsets where necessary to accommodate conditions arising in the field.
 - 4. Flexible connections shall be installed at the inlet and outlet of each fan and in main runs of ductwork where indicated. Flexible connections shall be 30 oz. glass cloth with neoprene coating on each face.
 - 5. Seal all joints with a water based sealant, equal to DUCTMATE PROseal or approved equal, applied per manufacturer's recommendations. Joints shall be sealed to meet SMACNA Seal Class A.
 - 6. Dimensions of acoustically lined ductwork shown on plans are inside dimensions of the duct after the lining has been installed.
 - 7. Sheet metal angle closures shall be provided around all ductwork penetrating walls exposed to view.
 - 8. Flat seam construction shall be employed where standing seam may present a hazard to personnel.
 - 9. All exposed ductwork shall have a paintable finish and shall be field cleaned and prepared for final painting.

- B. Spiral and Flat Oval Ductwork:
 - 1. Spiral and flat oval ductwork shall be SMACNA recommended gauge, medium and low pressure uniseal duct and fittings as manufactured by United Sheet Metal or approved equal.
 - 2. Duct shall be machine formed, made from standard gauge premium grade, coiled, galvanized sheet metal in a series of continuous automatic operations.
 - 3. Duct shall be manufactured from galvanized steel meeting ASTM A-527-71 in manufacturer's gauges.
 - 4. Fittings shall be die-stamped SMACNA recommended gauge galvanized steel, continuously welded seams.
 - 5. Joints shall be slip coupling type sealed with DUCTMATE PROseal or equal. Low pressure ductwork shall be sealed to meet SMACNA Seal Class C 2" w.g., and medium pressure Seal Class A 4" w.g., as applicable.
 - 6. Longitudinal snap-lock galvanized ductwork (ASTM A653 and A924) with G-60 galvanized coating of SMACNA recommended gauge, equal to Ductmate Greenseam pipe, and associated fittings, including adjustable elbows and volume dampers, may be used for concealed low pressure (-1" w.g. to 2" w.g.) applications. Install one (1) mechanical fastener (screw) in longitudinal seam of each straight run. Spiral duct shall be used for all exposed and medium pressure applications.
 - 7. All exposed ductwork shall have a paintable finish and shall be field cleaned and prepared for final painting.
- C. Flex Duct:
 - 1. Flexible duct shall be coated, fiberglass cloth fabric liner as manufactured by Buckley "Fabfi-Flex Type 4", Thermaflex, Novaflex or equal, uninsulated for ventilating applications (exhaust or return) and insulated for heating and cooling applications (supply).
- D. Access Doors:
 - 1. Access doors shall be provided no smaller than 12"x12" (if duct size permits) to completely access and functionally service equipment contained within the ductwork.
 - 2. Access doors shall meet ASHRAE Standards criteria, and be equal to Ruskin model ADC22 for rectangular ductwork, or United McGill bolted access doors for spiral ductwork.
 - 3. Access doors shall be installed in ductwork on upstream and downstream sides of all heating coils and as required to reset fire dampers.
 - 4. Coordinate location of access doors with all trades to allow full door size access to interior of ductwork.
- E. Snap Lock Ductwork:
 - Longitudinal snap-lock galvanized ductwork (ASTM A653 and A924) with G-60 galvanized coating of SMACNA recommended gauge, equal to Ductmate Greenseam pipe, and associated fittings, including adjustable elbows and volume dampers, may be used for concealed low pressure (-1" w.g. to 2" w.g.) applications. Install one (1) mechanical fastener (screw) in longitudinal seam of

each straight run. Spiral duct shall be used for all exposed and medium pressure applications.

- F. Fire Dampers:
 - 1. Fire dampers shall be installed where shown and/or required by all applicable codes and regulations. Dampers shall be Type B, low leakage, out airstream type and meet UL 555 rating requirements for dynamic systems. All dynamic fire dampers installed in low pressure ductwork shall be rated for 2000 feet per minute and 4" w.g. static pressure as required by UL 555.

END OF SECTION 23 31 00

SECTION 23 34 00 – HVAC FANS

PART 1 GENERAL

1.1 SCOPE

- A. Provide fans of type scheduled on the drawings, or as manufactured by Greenheck, Twin City or Cook.
- B. Capacities and types of fans shall be in accordance with fans scheduled on the drawings. Fans shall have direction and arrangement to suit space conditions, unless otherwise directed, and shall conform to the layouts shown.
- C. Fan assembly shall be mounted on resilient mounts for quiet operation.
- D. Vibration isolation mounts and expanded metal belt guards shall be provided for all fans as required.
- E. Provide a unit mounted on-off sentinel switch for each unit. Provide remote mounted pushbutton stations with pilot lights where indicated on the drawings.

PART 2 PRODUCT

2.1 SUBSTITUTIONS

A. Materials shall be as specified herein, except consideration shall be given to other products that meet or exceed those specified if requested five (5) business days prior to the date of bid opening in accordance with Section 01 60 00, Product Requirements.

END OF SECTION 23 34 00

SECTION 23 37 00 - AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 GRILLES, REGISTERS, DIFFUSERS AND LOUVERS

- A. Furnish and install grilles, registers, diffusers and louvers of size, type and quality indicated.
- B. Grilles, registers, diffusers and louvers shall be as manufactured by Metal Aire, Price, USAIRE or approved equal. Louvers shall be as manufactured by Greenheck, Airolite or Ruskin.
- C. Exact location of all grilles, registers and diffusers shall be coordinated in the field.
- D. Final color selection of louvers shall be by the Owner.

END OF SECTION 23 37 00

SECTION 25 00 00 - INTEGRATED AUTOMATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish and install application specific controllers and electric/electronic control specialties as described hereinafter.
- B. The control system shall be installed by technicians who regularly implement, start-up and commission control systems, hereinafter referred to as the ATC Contractor. All control equipment shall be compatible.

1.2 SYSTEM(S) DESCRIPTION

- A. River Valley Community College (RVCC) is currently serviced by Basix Automation Integrators, Inc.. Project intent is that Basix furnish and install all controls described in this project. The existing system in each facility shall be extended to new equipment, and the existing front end shall be updated. The new EMS shall be installed by competent and proven technicians who regularly install, start-up and commission DDC systems, hereinafter referred to as the ATC Contractor.
- B. The DDC system shall consist of all hardware, Graphical User Interface (GUI), software (graphics and logic), sensors, thermostats, temperature transmitters, transducers, controllers, automatic valves, dampers, damper operators, switches, panels and other accessory equipment, along with a complete system of electrical/communication wiring, to satisfy the intent of this specification and provide a complete and operable Energy Management System. All control equipment shall be fully proportioning unless noted otherwise. BACnet protocol is required.
- C. ATC Sequence Check All control sequences of operation shall be independently verified by the Testing and Balancing agency according to the requirements of Section 15010 1.10 and 15011. (Note: Should systems be found incomplete or not performing per specification, this contractor shall correct deficiencies and the Testing and Balancing agency shall recheck until all sequences have been independently verified.)
- D. In cooperation with this contractor, the Mechanical Contractor shall:
 - 1. Install automatic valves (ACV's) and separable wells supplied by the Control Contractor.
 - 2. Provide on magnetic starters furnished, all necessary step-down transformers and auxiliary contacts, with buttons and switches in the required configurations.
 - 3. Install all gasketed, ultra-low leak automatic dampers (ACD's).

- 4. Provide necessary blank-off plates (safing) required to install dampers that are smaller than duct size.
- 5. Assemble multiple section dampers with required interconnecting linkages and extend required number of shafts through duct for external mounting of damper motors.
- 6. Provide necessary sheet metal baffle plates to eliminate stratification and provide air volumes specified. Locate baffles by experimentation and affix and seal permanently in place only after stratification problem has been eliminated.
- 7. Provide access doors or other approved means of access through ducts for service of control equipment.
 - Each zone sensor wireless communication interface shall be capable of many-to-one sensors per controller to support averaging, monitoring, and multiple zone applications. Sensing options shall include temperature and occupancy.

1.4 RELATED DIVISIONS and SECTIONS

- A. DIVISION 23 Heating and Ventilating (H&V)
- B. DIVISION 26 Electrical

1.5 REFERENCES

- A. 2018 International Building Code with State of NH Amendment
- B. 2018 NFPA 101, Life Safety Code with State of NH Amendments
- C. New Hampshire State Fire Code Saf-C6000
- D. 2018 NFPA 1, Fire Prevention Code with State of NH Amendments
- E. 2018 International Plumbing Code with State of NH Amendments
- F. 2018 International Mechanical Code with State of NH Amendments
- G. 2018 International Energy Conservation Code with State of NH Amendments
- H. 2020 National Electric Code with State of NH Amendments
- I. City of Claremont prevailing ordinances, rules and regulations
- J. City of Claremont Fire Department(s) rules and regulations
- K. All applicable ASTM Standards.

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1.6 SUBMITTALS

A. Ordering of equipment and materials for installation shall not proceed without an approved submittal.

END OF SECTION 25 00 00

SECTION 25 08 00 - COMMISSIONING OF INTEGRATED AUTOMATION

PART 1 - GENERAL

1.1 COMMISSIONING

- A. Complete commissioning of the entire ATC system by the ATC Contractor is required. The ATC Contractor shall provide a written statement certifying that commissioning has been completed prior to executing the specified ATC sequence check by the Testing & Balancing Contractor.
- B. Commissioning procedures shall include, but not be limited to, the following:
 - 1. Verification of Proper Control Response: The ATC Contractor shall simulate all possible environmental conditions at controlling sensors, and shall witness, both digitally and physically, response of associated controlled devices. (For example, in response to a call for heat at a thermostat, the associated heating coil ACV modulates open to the coil.)
 - 2. Physical Verification of Device Positioning: The ATC Contractor shall physically verify, for example, that an ACV is fully closed when the ATC system indicates that the ACV is fully closed.
 - 3. Calibration of All Sensors and Thermostats: The ATC Contractor shall verify that all digital readings from controlling sensors are accurate. Digital readings from sensors and thermostats shall be compared with readings from calibrated test instruments placed next to the sensor. Testing shall be performed over the likely range of the sensor. Sensors that cannot be calibrated to match readings of test instruments, within a reasonable margin of error, shall be replaced. The ATC Contractor shall submit a written statement indicating that calibration has been performed. Statement shall include listing of all devices calibrated, documentation of test instruments used including certification of accuracy, and listing of acceptable accuracy range for each type of device calibrated.

1.2 ATC SEQUENCE CHECK

- A. This contractor shall notify the Mechanical Contractor of the completion of system installation and calibration, and schedule through same the performance of an ATC sequence check by the Testing & Balancing Subcontractor.
 - 1. Provide a technician who is thoroughly familiar with the project and the ATC program to work with the Balancing Contractor in verifying total system operations.
 - 2. Should systems be found incomplete or not performing per specification, the ATC Contractor shall correct deficiencies and the Testing & Balancing Agency shall recheck until all sequences have been verified.

END OF SECTION 25 08 00

SECTION 25 10 00 - INTEGRATED AUTOMATION NETWORK EQUIPMENT

PART 1 - GENERAL

1.1 EQUIPMENT

- A. In cooperation with the ATC Contractor, the Mechanical Contractor shall:
 - 1. Install automatic control valves (ACV) and separable wells supplied by the ATC Contractor.
 - 2. Provide, on magnetic starters furnished, all necessary step-down transformers and auxiliary contacts, with push buttons and switches in the required configuration. The ATC Contractor shall be responsible for coordinating needs with the Mechanical Contractor in advance of ordering.
 - 3. Install all gasketed, ultra-low leak automatic control dampers (ACD) supplied by the ATC Contractor.
 - 4. Provide necessary blank-off plates (safing) required to install dampers that are smaller than duct size.
 - 5. Assemble multiple section dampers with required interconnecting linkages and extend required number of shafts through duct for external mounting of damper motors.
 - 6. Provide access doors or other approved means of access through ducts for service of control equipment.
- B. Electric Wiring:
 - 1. All electric wiring and wiring connections required for the installation of the control system, as herein specified, shall be provided by this contractor, unless specifically shown on the electrical drawings or called for in the electrical specifications.
 - 2. The control system shall be installed and wired by factory trained and certified technicians in accordance with all pertinent codes, particularly the National Electric Code (N.E.C.). All low voltage communication wiring run in areas or spaces susceptible to damage, i.e., the Boiler Room, etc., shall be protected within EMT. All other may be plenum rated cable secured to structure within walls or ceiling space as high as possible in a workmanlike manner, installed to eliminate risk of accidental pull or cutting by other contractors.
- C. Service and Training:
 - 1. The ATC Contractor shall provide start-up, commissioning and Owner representative training by a certified service technician who is experienced in start-up, repair and training services. The commissioning personnel shall be the same personnel who installed the system and shall provide service and warranty repairs.
 - 2. There shall be at least 8 hours of Owner training time carried in the contract.

- D. Submittals:
 - 1. Submit shop drawings with detailed wiring diagrams, bill of materials and description of systems operations, in accordance with SECTION 01 33 00.
 - 2. Provide the Owner's representatives any additional information or data which is deemed necessary to determine compliance with these specifications or which is deemed valuable in documenting the system to be installed.
 - 3. Submit the following:
 - a. A complete bill of materials of equipment to be used indicating quantity, manufacturer and model number.
 - b. A schedule of all control valves including the valve size, model number (including pattern and connections), flow, CV rating, pressure rating and location.
 - c. A schedule of all control dampers. This shall include the damper size, pressure drop, manufacturer and model number.
 - d. Provide manufacturers cut sheets for major system components. When manufacturer's cut sheets apply to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Each submitted piece of literature and drawings shall clearly reference the specification and/or drawing that the submittal is being submitted to cover.
 - 4. Each submittal shall include the following information:
 - a. EMS riser diagram showing all DDC controllers, operator workstations, network repeaters and network wiring.
 - b. One-line schematics and system flow diagrams showing the location of all control devices.
 - c. Points list for each DDC controller, including tag, point type, system name, object name, expanded ID, display units, controller type, address, cable destination, module type, terminal ID, panel, slot number, reference drawing and cable number.
 - 5. The Controls Contractor shall submit written description for each sequence of operation to include the following:
 - a. Sequences shall reference input/output and software parameters by name and description.
 - b. The sequences of operations provided in the submittal by the Controls Contractor shall represent the detailed analysis needed to create actual programming code from the design documents.
 - c. Points shall be referenced by name, including all software points such as programmable setpoints, range limits, time delays, and so forth.
 - d. The sequence of operations shall cover normal operation and operation under the various alarm conditions applicable to that system.
 - 6. Upon completion of installation, submit three (3) copies of record (as-built) documents. The documents shall be submitted for approval prior to final completion and include:
- a. Project Record Drawings shall be as-built versions of the submittal shop drawings. One set of electronic media including CAD .DWG or .DXF drawing files shall also be provided.
- b. Testing and Commissioning Reports and Checklists.
- c. Operation & Maintenance (O&M) manual shall be as-built versions of the submittal product data. Also included shall be the names, address and 24-hour telephone numbers for the ATC Contractor's service department.
- d. Recommended preventive maintenance procedures for all system components including a schedule of tasks (inspection, cleaning, calibration, etc.) time between tasks and task descriptions.
- E. Warranty:
 - 1. Warrant all work as follows:
 - a. Labor and materials for control system specified shall be warranted free from defects for a period of 12 months after final completion acceptance by the Owner. Control System failures during the warranty period shall be adjusted, repaired, or replaced at no charge or reduction in service to the Owner. The contractor shall respond to the Owner's request for warranty service within 24 hours during customary business hours.

PART 2 – PRODUCT

2.1 AUTOMATIC CONTROL DAMPERS

- A. Damper frames shall be 16 gauge galvanized sheet metal or ¹/₈" extruded aluminum with reinforced corner bracing.
- B. Damper blades shall not exceed 8" in width or 48" in length. Blades are to be suitable for medium velocity performance (2,000 fpm). Blades shall be not less than 16 gauge.
- C. Damper shaft bearings shall be as recommended by manufacturer for application.
- D. All blade edges and top and bottom of the frame shall be provided with compressible seals. Side seals shall be compressible stainless steel. The blade seals shall provide for a maximum leakage rate of 10 CFM per square foot at 2.05" W.C. differential pressure.
- E. All leakage testing and pressure ratings will be based on AMCA Publication 500.
- F. Individual damper sections shall not be larger than 48" x 60". Provide a minimum of one damper actuator per section.
- G. Control dampers shall be parallel or opposed blade types as scheduled on drawings.
- H. Dampers shall be insulated type, similar to Ruskin model CD40x2 where called for on the drawings.

2.2 CONTROL VALVES

- A. Control valves shall be two-way or three-way type for two-position or modulating service as scheduled or shown.
- B. Close-off (differential) Pressure Rating: Valve actuator and trim shall be furnished to provide the following minimum close-off pressure ratings:
 - 1. Water Valves:
 - a. Two-way: 150% of total system (pump) head.
 - b. Three-way: 300% of pressure differential between ports A and B at design flow or 100% of total system (pump) head.
- C. Water Valves:
 - 1. Body and trim style and materials shall be per manufacturer's recommendations for design conditions and service shown, with equal percentage ports for modulating service.
 - 2. Sizing Criteria:
 - a. Two-position service: Line size.
 - b. Two-way modulating service: Pressure drop shall be equal to twice the pressure drop through heat exchanger (load), 50% of the pressure difference between supply and return mains, or 3 psi, whichever is greater.
 - c. Three-way Modulating Service: Pressure drop equal to twice the pressure drop through the coil exchanger (load), 3 psi maximum.
 - d. Valves ½" through 2" shall be bronze body or cast brass ANSI Class 250, spring loaded, Teflon packing, quick opening for two-position service. Two-way valves shall have replaceable composition disc, or stainless steel ball.
 - e. 2¹/₂" valves and larger shall be cast iron ANSI Class 125with guided plug and Teflon packing.
 - 3. Water valves shall fail normally open or closed as scheduled on plans or as follows:
 - a. Heating coils in air handlers normally-open.
 - b. Hydronic terminals control valves normally-open.
 - c. Other applications as scheduled or as required by sequence of operation.
 - 4. Zone valves shall be sized to meet the control application and they shall maintain their last position in the event of a power failure.

2.3 ELECTRONIC DAMPER/VALVE ACTUATORS

A. The actuator shall have electronic overload or digital rotation sensing circuitry to prevent damage to the actuator throughout the rotation of the actuator.

- B. Where shown, for power-failure/safety applications, an internal mechanical, spring return mechanism shall be built into the actuator housing.
- C. All rotary spring return actuators shall be capable of either clockwise or counter clockwise spring return operation. Linear actuators shall spring return to the retracted position.
- D. Proportional actuators shall accept a 0-10 VDC or 0-20 mA control signal and provide a 2-10 VDC or 4-20 mA operating range.
- E. All 24 VAC/DC actuators shall operate on Class 2 wiring and shall not require more than 10 VA for AC or more than 8 W for DC applications. Actuators operating on 120 VAC or 230 VAC shall not require more than 11 VA.
- F. All non-spring return actuators shall have an external manual gear release to allow manual positioning of the damper or valve when the actuator is not powered. Spring-return actuators with more than 60 in-lb. torque capacity shall have a manual crank for this purpose.
- G. All modulating actuators shall have an external, built-in switch to allow the reversing of direction of rotation
- H. Actuators shall be provided with a conduit fitting and a minimum 1m electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.
- I. Actuators shall be UL Standard 873 listed.
- J. Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuator's rated torque.

2.4 OUTDOOR AIR SENSORS

- A. Outdoor air sensors shall be provided of the type required to provide the sequence of control specified.
- B. Outside sensors shall be located high on a shaded wall and shall be vandal resistant.

2.5 THERMOSTATS/TEMPERATURE SENSORS

A. This contractor shall provide space thermostats/sensors where indicated on plans. All space temperature sensors shall include local adjustment capability. Furnish and install vandal proof guards where indicated on plans.

END OF SECTION 25 10 00

SECTION 25 90 00 - INTEGRATED AUTOMATION CONTROL SEQUENCES

PART 1 - GENERAL 1.1 SEQUENCES OF OPERATION

- 1) Radiation Control:
 - a) Radiation shall be controlled by a two-way, two-position, electric ACV to respond to thermostat command. ACV shall open/close as required to maintain space temperature set point, acting as a second stage of heat if the fan coil unit cannot maintain room temperature set point. Unoccupied temperature set points shall be adjustable through the EMS only.
 - b) Graphics List:
 - i) Space temperature
 - ii) Space temperature setpoint (per occupancy mode)
 - iii) Occupancy schedule
 - iv) ACV commanded position Open/Closed
- 2) Fan Coil Unit (FCU) Control:
 - a) Install factory furnished controls provided with the fan coil/heat pump system in accordance with the manufacturer's published instructions. Provide graphical interface available through the BACnet card provided with the system.
- 3) Global Hot Water Valves Control:
 - a) To facilitate balancing of the hot water systems, a global command shall be programmed to open all ACV's in the hot water systems.
- 4) EF-1 Control:
 - a) The exhaust fan shall be interlock by this contractor to run whenever the biosafety cabinet is manually switched on, EF-1 shall be energized "ON". When the bio-safety cabinet is manually switched off, EF-1 shall be de-energized "OFF".
 - b) Graphics List:
 - i) Status
 - ii) Alarm
- 5) EF-2, 3, 4 & 5 Control:
 - a) The exhaust fans shall be controlled by a manual wall switch, furnished and installed by the Electrical Contractor. When the switch is manually switched "on", the associated motor operated damper shall open and the fan shall energize. When the switch is manually switched "off", the fan shall deenergize and the associated motor operated damper shall shut.
 - b) Graphics List:
 - i) Status
 - ii) Alarm

END OF SECTION 25 90 00

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 - GENERAL

1.1 EXAMINATION

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Report discrepancies to Owner/Engineer before disturbing existing installation.
- C. Beginning of demolition means installer accepts existing conditions.

1.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Existing Electrical Service: Maintain existing system in service until new equipment is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.

1.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.
- F. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - PRODUCTS

1.1 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

1.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- H. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - 3. Color Code:
 - a. Equipment Ground, All Systems: Green.

1.3 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 - 1. Feeders and Branch Circuits:
 - b. Size 10 AWG and Smaller: Solid.
 - c. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.

- D. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
- 1.4 WIRING CONNECTORS
 - A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - PRODUCTS

1.1 GROUNDING AND BONDING REQUIREMENTS

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

1.2 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
 - 1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
 - 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 - 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
 - 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - PRODUCTS

1.1 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
- D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
 - 1. Comply with MFMA-4.
- E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
- F. Anchors and Fasteners:
 - 1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

- D. Unless specifically indicated or approved by Owner/Engineer, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Owner/Engineer, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to stude to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- H. Secure fasteners according to manufacturer's recommended torque settings.
- I. Remove temporary supports.

SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 - PRODUCTS

1.1 CONDUIT REQUIREMENTS

- A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- 1.2 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)
 - A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
 - B. Fittings:
 - 1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Material: Use steel or malleable iron.
 - 3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.
- 1.3 ELECTRICAL METALLIC TUBING (EMT)
 - A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
 - B. Fittings:
 - 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Material: Use steel or malleable iron.
 - 3. Connectors and Couplings: Use compression (gland) or set-screw type.
 - a. Do not use indenter type connectors and couplings.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

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- D. Conduit Support:
 - 1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Connections and Terminations:
 - 1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 - 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 - 3. Use suitable adapters where required to transition from one type of conduit to another.
 - 4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 - 5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
 - 6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- F. Penetrations:
 - 1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 - 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 - 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 - 4. Conceal bends for conduit risers emerging above ground.
 - 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
 - 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 - 7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
 - 8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- G. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
 - 1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 - 2. Where conduits are subject to earth movement by settlement or frost.
- H. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
 - 1. Where conduits pass from outdoors into conditioned interior spaces.

- 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- I. Provide grounding and bonding in accordance with Section 26 05 26.

SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 - PRODUCTS

1.1 BOXES

- A. General Requirements:
 - 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 - 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 - 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 - 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
 - 1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 - 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 - 3. Use suitable concrete type boxes where flush-mounted in concrete.
 - 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 - 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 - 6. Use shallow boxes where required by the type of wall construction.
 - 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 - 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 - 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 - 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 - 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 - 12. Wall Plates: Comply with Section 26 27 26.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
 - 1. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - 2. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 2 – EXECUTION

2.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
- E. Install boxes plumb and level.
- F. Flush-Mounted Boxes:
 - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
 - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
- G. Install boxes as required to preserve insulation integrity.
- H. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- I. Install firestopping to preserve fire resistance rating of partitions and other elements.
- J. Close unused box openings.
- K. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- L. Provide grounding and bonding in accordance with Section 26 05 26.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Warning signs and labels.

1.2 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

1.3 REFERENCE STANDARDS

- A. ANSI Z535.2 American National Standard for Environmental and Facility Safety Signs.
- B. ANSI Z535.4 American National Standard for Product Safety Signs and Labels.
- C. NFPA 70 National Electrical Code.
- D. UL 969 Marking and Labeling Systems.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

- 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

1.5 SUBMITTALS

A. See Administrative Requirements for submittals procedures.

- 1.6 QUALITY ASSURANCE
 - A. Conform to requirements of NFPA 70.
- 1.7 FIELD CONDITIONS
 - A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 - PRODUCTS

2.1 IDENTIFICATION REQUIREMENTS

- A. Identification for Equipment:
 - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Panelboards:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - 2) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
 - For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
 - 2. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
 - a. Service equipment.
 - b. Industrial control panels.
 - c. Motor control centers.
 - d. Elevator control panels.
 - e. Industrial machinery.
- B. Identification for Conductors and Cables:
 - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
 - 2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

2.2 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Labels:
 - 1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.

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2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

2.3 WARNING SIGNS AND LABELS

- A. Manufacturers:
 - 1. Brimar Industries, Inc: www.brimar.com/#sle.
 - 2. Clarion Safety Systems, LLC: www.clarionsafety.com/#sle.
 - 3. Seton Identification Products: www.seton.com/#sle.
- B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- C. Warning Signs:
 - 1. Materials:
 - 2. Minimum Size: 7 by 10 inches unless otherwise indicated.
- D. Warning Labels:
 - 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
 - 2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
 - 3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 - 1. Surface-Mounted Equipment: Enclosure front.
 - 2. Flush-Mounted Equipment: Inside of equipment door.
 - 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 - 4. Elevated Equipment: Legible from the floor or working platform.
 - 5. Branch Devices: Adjacent to device.
 - 6. Interior Components: Legible from the point of access.
 - 7. Conductors and Cables: Legible from the point of access.
- C. Install identification products centered, level, and parallel with lines of item being identified.

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- D. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- E. Mark all handwritten text, where permitted, to be neat and legible.

SECTION 26 05 83 - WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wall switches.
- B. Receptacles.
- C. Wall plates.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 19 Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
- B. Section 26 05 26 Grounding and Bonding for Electrical Systems.
- C. Section 26 05 33.16 Boxes for Electrical Systems.
- D. Section 26 05 53 Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 05 83 Wiring Connections: Cords and plugs for equipment.

1.3 REFERENCE STANDARDS

- A. FS W-C-596 Connector, Electrical, Power, General Specification for 2017h.
- B. FS W-S-896 Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification) 2017g.
- C. NECA 1 Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 130 Standard for Installing and Maintaining Wiring Devices 2010.
- E. NEMA WD 1 General Color Requirements for Wiring Devices 1999 (Reaffirmed 2015).
- F. NEMA WD 6 Wiring Devices Dimensional Specifications 2016.
- G. NFPA 70 National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 General-Use Snap Switches Current Edition, Including All Revisions.

- I. UL 498 Attachment Plugs and Receptacles Current Edition, Including All Revisions.
- J. UL 514D Cover Plates for Flush-Mounted Wiring Devices Current Edition, Including All Revisions.
- K. UL 943 Ground-Fault Circuit-Interrupters Current Edition, Including All Revisions.
- L. UL 1310 Class 2 Power Units Current Edition, Including All Revisions.
- M. UL 1449 Standard for Surge Protective Devices Current Edition, Including All Revisions.
- N. UL 1472 Solid-State Dimming Controls Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience
- D. Products: Listed, classified, and labeled as suitable for the purpose intended.
- E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
 - 1. Colors: Conform to NEMA WD 1.
 - 2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
 - 3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Provide receptacle outlet to accommodate connection with attachment plug.
- E. Provide cord and cap where field-supplied attachment plug is required.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

SECTION 26 24 16 PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Power distribution panelboards.
- B. Lighting and appliance panelboards.
- C. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 26 Grounding and Bonding for Electrical Systems.
- B. Section 26 05 29 Hangers and Supports for Electrical Systems.
- C. Section 26 05 53 Identification for Electrical Systems: Identification products and requirements.
- D. Section 26 05 73 Power System Studies: Additional criteria for the selection and adjustment of equipment and associated protective devices specified in this section.
- E. Section 26 43 00 Surge Protective Devices.

1.03 REFERENCE STANDARDS

- A. FS W-C-375 Circuit Breakers, Molded Case; Branch Circuit and Service; Federal Specification.
- B. NECA 407 Standard for Installing and Maintaining Panelboards.
- C. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. NEMA PB 1 Panelboards.
- E. NFPA 70 National Electrical Code.
- F. UL 50 Enclosures for Electrical Equipment, Non-Environmental Considerations.
- G. UL 50E Enclosures for Electrical Equipment, Environmental Considerations.
- H. UL 67 Panelboards.
- I. UL 489 Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
- J. UL 943 Ground-Fault Circuit-Interrupters.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate the work with other trades to provide walls suitable for installation of flushmounted panelboards where indicated.
 - 4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 5. Notify Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

PANELBOARDS 26 24 16 - Page 1 of 3

1.05 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
- C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
- D. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.
- E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 Product Requirements, for additional provisions.
 - 2. Panelboard Keys: Two of each different key.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature within the following limits during and after installation of panelboards:
 - 1. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Siemens

2.02 OVERCURRENT PROTECTIVE DEVICES

- A. Molded Case Circuit Breakers:
 - 1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
 - 2. Interrupting Capacity:
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
 - 1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
 - 2) 14,000 rms symmetrical amperes at 480 VAC.

PANELBOARDS 26 24 16 - Page 2 of 3

- b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
- 3. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
- 4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
 - a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 100 amperes up to 200 amperes.
- 5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units for breakers 225 ampere and larger
 - a. Provide the following field-adjustable trip response settings:
 - 1) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
 - 2) Long time delay.
 - 3) Short time pickup and delay.
 - 4) Instantaneous pickup.
- 6. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
- 7. Provide the following circuit breaker types where indicated:
 - a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
 - b. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
- 8. Do not use tandem circuit breakers.
- 9. Do not use handle ties in lieu of multi-pole circuit breakers.
- 10. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.
- 11. Provide the following features and accessories where indicated or where required to complete installation:
 - a. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
 - b. Handle Pad-Lock Provision: For locking circuit breaker handle in OFF position.

2.06 SOURCE QUALITY CONTROL

A. Factory test panelboards according to NEMA PB 1.

END OF SECTION 26 24 16

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Receptacles.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 26 Grounding and Bonding for Electrical Systems.
- B. Section 26 05 33.16 Boxes for Electrical Systems.
- C. Section 26 05 53 Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

- A. FS W-C-596 Connector, Electrical, Power, General Specification for.
- B. NECA 1 Standard for Good Workmanship in Electrical Construction.
- C. NECA 130 Standard for Installing and Maintaining Wiring Devices.
- D. NEMA WD 1 General Color Requirements for Wiring Devices.
- E. NEMA WD 6 Wiring Devices Dimensional Specifications.
- F. NFPA 70 National Electrical Code.
- G. UL 498 Attachment Plugs and Receptacles.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 4. Notify Owner/Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

A. See Administrative Requirements for submittal procedures.

WIRING DEVICES 26 27 26 - Page 1 of 4

- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- 1.6 QUALITY ASSURANCE
 - A. Conform to requirements of NFPA 70.
 - B. Products: Listed, classified, and labeled as suitable for the purpose intended.
- 1.7 DELIVERY, STORAGE, AND PROTECTION
 - A. Store in a clean, dry space in original manufacturer's packaging until ready for

installation.

PART 2 - PRODUCTS

- 2.1 WIRING DEVICE APPLICATIONS
 - A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
 - B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
 - C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

2.2 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: White.

2.3 RECEPTACLES

- A. Manufacturers:
 - 1. Hubbell Incorporated: www.hubbell.com/#sle.
 - 2. Leviton Manufacturing Company, Inc: <u>www.leviton.com/#sle</u>.
- B. Receptacles General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.

WIRING DEVICES 26 27 26 - Page 2 of 4 2. NEMA configurations specified are according to NEMA WD 6.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- I. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- J. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.3 FIELD QUALITY CONTROL

- A. Inspect each wiring device for damage and defects.
- B. Test each receptacle to verify operation and proper polarity.

WIRING DEVICES 26 27 26 - Page 3 of 4 C. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.4 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 26 27 26
SECTION 26 28 16.16 - ENCLOSED SWITCHES

PART 1 - PRODUCTS

1.1 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet.
 - 2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Conductor Terminations: Suitable for use with the conductors to be installed.
- I. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- J. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
- K. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- L. Heavy Duty Switches:
 - 1. Comply with NEMA KS 1.
 - 2. Conductor Terminations:
 - a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
 - 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).

ENCLOSED SWITCHES 26 28 16.16 - Page 1 of 2

- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required supports in accordance with Section 26 05 29.
- E. Install enclosed switches plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 26 05 26.

END OF SECTION 26 28 16.16

SECTION 28 46 00 - FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Rework of existing Mircom FX-2000 Fire Alarm system with complete design and installation, including all components, wiring, and conduit.
- B. Renovation of existing school, utilizing existing devices and wiring, including adds, moves and changes.
- 1.2 RELATED REQUIREMENTS
 - A. Section 23 31 00 Air Duct Accessories: Smoke dampers monitored and controlled by fire alarm system.
- 1.3 REFERENCE STANDARDS
 - A. 36 CFR 1191 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Engineerural Barriers Act (ABA) Accessibility Guidelines.
 - B. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design.
 - C. IEEE C62.41.2 Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits.
 - D. NFPA 70 National Electrical Code.
 - E. NFPA 72 National Fire Alarm and Signaling Code.
 - F. NFPA 101 Life Safety Code.
- 1.4 SUBMITTALS
 - A. See Administrative Requirements, for submittal procedures.
 - B. Proposal Documents: Submit the following with cost/time proposal:
 - 1. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 2. Manufacturer's detailed data sheet for each control unit, initiating device, and notification appliance.
 - 3. Certification by Contractor that the system design will comply with the contract documents.
 - 4. Proposed maintenance contract.
 - C. Evidence of designer qualifications.

- D. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
 - 1. Copy (if any) of list of data required by authority having jurisdiction.
 - 2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
 - 4. System zone boundaries and interfaces to fire safety systems.
 - 5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
 - 6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
 - 7. List of all devices on each signaling line circuit, with spare capacity indicated.
 - 8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
 - 9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
 - 10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
 - 11. Certification by the manufacturer of the control unit that the system design complies with the contract documents.
 - 12. Certification by Contractor that the system design complies with the contract documents.
- E. Evidence of installer qualifications.
- F. Evidence of instructor qualifications; training lesson plan outline.
- G. Evidence of maintenance contractor qualifications, if different from installer.
- H. Inspection and Test Reports:
 - 1. Submit inspection and test plan prior to closeout demonstration.
 - 2. Submit documentation of satisfactory inspections and tests.
 - 3. Submit NFPA 72 "Inspection and Test Form," filled out.
- I. Operating and Maintenance Data: See Section 017800 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
 - 1. Complete set of specified design documents, as approved by authority having jurisdiction.
 - 2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
 - 3. Contact information for firm that will be providing contract maintenance and trouble call-back service.

- 4. List of recommended spare parts, tools, and instruments for testing.
- 5. Replacement parts list with current prices, and source of supply.
- 6. Detailed troubleshooting guide and large scale input/output matrix.
- 7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
- 8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.
- J. Project Record Documents: Have one set available during closeout demonstration:
 - 1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
 - 2. "As installed" wiring and schematic diagrams, with final terminal identifications.
 - 3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
- K. Closeout Documents:
 - 1. Certification by manufacturer that the system has been installed in compliance with his installation requirements, is complete, and is in satisfactory operating condition.
 - 2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.
- B. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
 - 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
 - 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
 - 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
- C. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.
- D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.

1.6 WARRANTY

- A. See Closeout Submittals, for additional warranty requirements.
- B. Provide control panel manufacturer's warranty that system components other than wire and conduit are free from defects and will remain so for 1 year after date of Substantial Completion.
- C. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIRE ALARM SYSTEM (Existing)

- A. Fire Alarm System: Provide adds, moves and changes to the existing automatic fire detection and alarm system, including deprogramming of existing devices and reprogramming of new and relocated devices complete.
 - 1. Provide all components necessary, regardless of whether shown in the contract documents or not.
 - 2. Protected Premises: Limits of the ground floor renovation associated with the construction bid set.
 - 3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
 - a. ADA Standards.
 - b. The requirements of the State Fire Marshal.
 - c. The requirements of the local authority having jurisdiction.
 - d. Applicable local codes.
 - e. The contract documents (drawings and specifications).
 - f. NFPA 101.
 - g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
 - 4. Evacuation Alarm: Single smoke zone; general evacuation of entire premises.
 - 5. Voice Notification: Provide emergency voice/alarm communications with multichannel capability; digital.
 - 6. Program notification zones and voice messages as directed by Owner.
 - 7. Hearing Impaired Occupants: Provide visible notification devices in all public areas
 - 8. Master Control Unit (Panel): Notifier NFS2-3030
 - 9. Combined Systems: Do not combine fire alarm system with other non-fire systems.
- B. Supervising Stations and Fire Department Connections:

- 1. Public Fire Department Notification: Manually activated public fire alarm box located at main entry.
- 2. Means of Transmission to Remote Supervising Station: Existing Fiber Network.
- 3. Auxiliary Connection Type: Local energy.
- C. Circuits:
 - 1. Initiating Device Circuits (IDC): Class B, Style A.
 - 2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
 - 3. Notification Appliance Circuits (NAC): Class B, Style W.
- D. Power Sources:
 - 1. Primary: Dedicated branch circuits of the facility power distribution system.
 - 2. Secondary: Storage batteries.
 - 3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.

2.2 FIRE SAFETY SYSTEMS INTERFACES

- A. Supervision: Provide supervisory signals in accordance with NFPA 72 for the following:
 - 1. Sprinkler water control valves.
- B. Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:
 - 1. Sprinkler water flow.
 - 2. Duct smoke detectors.
- D. HVAC:
 - 1. Duct Smoke Detectors: Close dampers indicated; shut down air handlers indicated.
- E. Doors:
 - 1. Electromagnetic Door Locks on Egress Doors: Unlock upon activation of any alarm initiating device or suppression system in smoke zone that doors serve as egress from.

2.3 COMPONENTS

- A. General:
 - 1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
 - 2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

- B. Fire Alarm Control Units, Initiating Devices, and Notification Appliances: Analog, addressable type; listed, classified, and labeled as suitable for the purpose intended.
- C. Master Control Unit: Existing
- D. Circuit Conductors: Copper, installed as fire alarm rated MC cable, limited to wiring concealed and walls and above accessible lay-in ceilings. Otherwise, conductors in conduit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- C. Obtain Owner's approval of locations of devices, before installation.
- D. Install instruction cards and labels.

3.2 INSPECTION AND TESTING FOR COMPLETION

- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.
- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 - 1. Record all system operations and malfunctions.
 - 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 - 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 - 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.3 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
 - 1. Be prepared to conduct any of the required tests.
 - 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
 - 3. Have authorized technical representative of control unit manufacturer present during demonstration.
 - 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
 - 5. Repeat demonstration until successful.

END OF SECTION 28 46 00

RVCC LAB RENOVATIONS

1 COLLEGE PLACE CLAREMONT NH 03743





CIVIL	LANDSCAPE	ARCHITECTURE	STRUCTURAL	MECHANICAL/PLUMBI	NG ELECTRICA
		WARRENSTREET ARCHITECTS, II 27 WARREN STREET CONCORD, NH 03301 P. (603) 225-0640 F. (603) 225-0621	NC.	YEATON ASSOCIATES 40 S RIVER RD, STE 36 BEDFORD, NH 03110 P. (603) 444 - 6578	YEATON ASSOCI/ 40 S RIVER RD, S BEDFORD, NH 03 P . (603) 444 - 657
NA	NA	COVER SHEET ADA, CONVERSIONS, SYMBOLS, SIGNAGE & ABBREVIATIONS CODE REVIEW CODE PLANS SECOND FLOOR DEMO PLAN AND DEMO REFLECTED CEILING PLAN SECOND FLOOR FURNITURE/ EQUIPMENT AND FINISH PLAN ENLARGED PLANS AND INTERIOR ELEVATIONS ENLARGED PLANS AND INTERIOR ELEVATIONS CASEWORK AND FUME EXTRACTION ARM DETAILS PARTITION TYPES & DOOR SCHEDULE	A000 A003 A004 A005 A101 A111 A161 A401 A402 A411 A601	MECHANICAL GENERAL NOTES, LEGEND & ABBREVIATIONS SCIENCE LAB #203 PART PLANS - DEMOLITION & NEW WORK CHEMISTRY LAB #224 PART PLANS - DEMOLITION & NEW WORK PLUMBING GENERAL NOTES, LEGEND & ABBREVIATIONS LEARNING CENTER # 123 PART PLANS DEMOLITOIN & NEW WORK SCIENCE LAB #203 PART PLANS - DEMOLITION & NEW WORK CLASSROOM #166 PART PLANS - DEMOLITION & NEW WORK CHEMISTRY LAB #224 PART PLANS - DEMOLITION & NEW WORK FIRST FLOOR PART PLANS - PFIRE PROTECTION OUTLINE	M1.0 ELECTRICAL SYMBOLS AND ABBREVIA M1.1 PART PLANS - ELECTRICAL DEMOLITIO M1.2 PART PLANS - LIGHTING P0.1 PART PLANS - POWER P1.1 SECOND FLOOR PLAN - ELECTRICAL P1.2 ELECTRICAL DETAILS P1.3 P1.4 FP1.1
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860://3773 CCSNH RIVER VALLEY LAB RENOVATIONS/RVCC 2022-04-04 LAB RENOVA

OWNER MATT MOORE

COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE 28 COLLEGE DR, CONCORD, NH 03301 P. (603) 344 5377

CONSTRUCTION MANAGER

MILESTONE ENGINEERING + CONSTRUCTION, INC PO BOX 2279 1 HORSESHOE POND LANE, CONCORD, NH 03302 - 2279 P. (603) 226 - 3877

WARRENSTREET ARCHITECTS, INC.

PLANNERS, ARCHITECTS, LANDSCAPE ARCHITECTS, INTERIOR DESIGNERS 27 WARREN STREET, CONCORD, NH 03301 P. (603) 225-0640

	OTHER	PROJECT:
ATES INC FE 36 110 3		RVCC LAB RENOVATIONS
		PROJECT NUMBER: 3773
ONS E0.1 ED1.1 E1.1	NA	ISSUE:
E1.2 E1.3 E5.1		FOR CONSTRUCTION
		ISSUE DATE: 03/24/2023
		ARCHITECT OF RECORD
		OTHEW HAND



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EARANCES				
CLEARANCE REQUIRED IF DOOR HAS CLOSER	CLEARANCE REQUIRED IF DOOR HAS CLOSER	3' - 0"		
2'-0" MIN0'- +	→ NIN NIN NIN NIN NIN NIN NIN NIN NIN NI		1' - 10" MIN 2' - 8" MIN 0 (5 A D)	
H/I LATCH APPROACH, PULL SIDE	J/K LATCH APPROACH, PUSH SIDE	L FRONT APPROACH, POCKET OR FOLDING DOOR	M POCKET APPROACH, POCKET DOOR	LATCH APPROACH, POCKET DOOR
MIN 2" CLEAR AT HANDRAILS TO ADJACENT FIXTURES AND ACCESSORIES 6" MAX. @ REAR 12" MAX. @ SIDE	36" MIN. @ REAR 42" MIN. @ SIDE 33" - 3 0, - 1, - 1, - 1, - 1, - 1, - 1, - 1,	BEFL. SURFACE	(900 VOP) SEE DWGS FOR PIPE PROTECTION TYPE CLEARANCE AREA II' - 5" MIN	SPOWER 59" LONG HOSE MIN 59" LONG HOSE MIN 3' - 2" - 48" 3' - 2" - 48" CONTROL HEIGHT 3' - 2" - 48" CONTROL HEIGHT 3' - 2" - 48" CONTROL HEIGHT 3' - 2" - 48" CONTROL HEIGHT CONTROL HEIGHT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) DIRECTLY ADJACENT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) DIRECTLY ADJACENT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) DIRECTLY ADJACENT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) CONTROL HEIGHT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) 1/2" MATER FOUNTAINS CONTROL HEIGHT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) 1/2" MATER FOUNTAINS CONTROL ADJACENT 1/2" MAX THRESHOLD HEIGHT (ADA 608.7) 1/2" MAX THRESHOL
CONTRACTORFECOORDINATEFFCORRIDORFFCARPETFFCARPETFFCERAMIC TILEFFCENTERFIICOUNTER SUNKFDCUBIC YARDFLDEEP, DEPTHFGDUSABLEDFFDOUBLEFFDEGREEFFDEMOLITIONFTDEFARTMENTFLDETAILFFDOUBLE HUNGFLDOUBLE HUNGFLDOMESTIC HOT WATERFUDIFFUSERFVDIFFUSERFVDIMENSIONGDISABLEDGADISABLEDGADISABLEDGADISPENSERGADOWNGIDOOR OPENINGGFDOMNGIDOOR OPENINGGFDIMENSION POINTGGDORNGIDONSPOUTHEDISHWASHERHEDRAWERHCEXANUS FANHCEXANUS FANHCEXANUS FANHCEXANUS FANHCECURICALHFELEVATIONHFELEVATIONHFELEVATIONHFECURICALHFENCLOSUREHTELECTRICALHFELECTRICALHFELEVATORHFELEVATORHTELEVATORHTELECTRICALHFELEVATORHTELEVATORHTEXHAUST FANH	E - FIRE EXTINGUISHER EC - FIRE EXTINGUISHER CABINET *** *** *** *** *** *** *** *	INT - INTERIOR INT - INTERMEDI IPMENT INV - INTERMEDI IPMENT INV - INTERMEDI IPMENT INV - INTERMEDI IPMENT INV - INTERMEDI INV - INTERMEDI - JANITOR'S JST - JOIST - JOIST JT - JOINT K - KIP (1000 LI KQ - KICK PLATE KG KG - KICK PLATE KG LAB - LABORATO LABORATORY LAM - LANDING LAW LAW - LANTORY LB LAW - LONG LEG LV LV - LONG LEG LV LV - LONG LEG LN LY <	ATE OFF ATE OPH OPNG OPP OPNG OPP OPNG OPP OPD OPP ORD OUTS OVHD PAV PAV PATD PAV PATD PAV PATD PAV PATD PAV PATD PAV PATD PAV PATD PAV PATD PAV PATD PAV PAV PATD PAV PATD PAV PAV PAV PAV PAV PAV PAV PAV	 OFFICE OPPOSITE HAND OPPOSITE OVERFLOW ROOF DRAIN OUTSIDE OVERHEAD PANT PANT PANTION PARTITION PAPER TOWEL DISPENSER PARTICLEBOARD PRECAST CONCRETE POWER DRIVEN FASTENER PERFORATED PERFORATED PERFORATED PERFORATE PLASTIC LAMINATE PLASTIC LAMINATE PLASTER PLASTER PLUMBING POUNDS PER LINEAR FOOT OVINT OF INTERSECTION PAREL PLOUBS PER LINEAR FOOT POUNDS PER LINEAR FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POINT PANTITION PAPER TOWEL RECEPTACLE QUARRY TILE QUARRY TILE QUARTITY RELOCATED RADIUS OR RISER REFLECTED CEILING PLAN ROOF DRAIN M RECOMMENDED REFERENCE REFLECTED VELECTIVE / REFLECT REFERENCE REFLECTED / REFLECTIVE / REFLECT REFERENCE REFLECTED / REINFORCING RECOSTER REFLOCATE REDIFORCED / REINFORCING RECOSTER REFLOCATE REDIFORCED / REINFORCING RECOSTER REFERENCE REFLOCATE REDIFORCED / REINFORCING RECOSTER REDIFORCED / REINFORCING RECOSTER RECOMMENDED RECOMME ROUGH OPENING RATING RATI

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]	RVCC LAB RENOVATION				11/30/2022	2018 International Existing Building Code	CODE		
1	Warrenstreet Architects, Inc. Project # 3773					Work area includes first floor lab rooms 127, 155, an	Required/Allowed d second floor lab rooms 203 and 224 of a	n existing type 2B building. The	Proposed ere are no chang
	Floor Area Total 4 Higher Education Labs 4497 SF real	novation area				Based on the Existing Building Code 2018, Rooms 15 The areas in question have ADA compliant facilit	5 and 203 are Level 2 Alteration, and room ies and entrances and the egress system for	ms 127 and 224 are level 1 Alter rom the new spaces meets IBC 2	ations. 2018.
	2018 International Building Code	CODE Required/Allowed 2B	Proposed		REFERENCE 602.2	Compliance Method Work area compliance method, chapters 6 through 12 Chapter 6 Chapter of Wark	2		
	Use Group	B			304.1	Chapter 6 - Classification of Work Work does NOT exceeds 50% of the building, theref Work not a change in occupancy remaining B	fore Level 1 and 2 alteration, therefore it mus	t comply with chapter 7 & 8.	
J	Height / Area	N/A - Renovation of existing lab				Building is sprinklered			
5	Separation Protection All Use Groups					Interior Finishes - All newly installed interior wall an Interior Finishes - All newly installed interior fi	nd ceiling finishes shall comply with chapter	8 of IBC 2018 of IBC 2018	
	Boiler and furnace rooms Where largest Equipment is > 400,000btu	1 hr or Auto Suppress	N/A		Table 509	Fire protection Alterations shall be done in a manner that mainta	ins the level of fire protection provided	01 1BC 2018	
	Boilers over 15psi and 10 hp. Refrigerant Machinery Rooms	1 hr or Auto Suppress 1 hr or Auto Suppress	N/A N/A		Table 509 Table 509	Means of Egress Alterations shall be done in a manner that mainta	ins the level of protection provided for the m	neans of egress	
	Hydrogen fuel gas rooms, not group H	1 hr in Group B,F,M,S & U 2 hr in Group A, E, I & R	N/A N/A		Table 509 Table 509	Energy Conservation Level 1 alterations to existing buildigns or structure	ares do not require the entire building or stru-	cture to comply with the energy	
	Incinerator Rooms Paint Shops, not classified in H, other than F	2 hr and Auto Suppress 2 hr or 1 hr & Auto Suppress	N/A N/A		Table 509 Table 509	requirements of the IECC. The alterations shall co construction only.	nform to the energy requirements of the IEC	C as they relate to new	
	Laboratories and vocational shops, not classified as Group H, located in Group E or I-2	1 hr or Auto Suppress	N/A		Table 509	Chapter 8 - Alterations - Level 2			
	Laundry > 100 sf Group I-3 with padded surfaces	1 hr or Auto Suppress 1 hr	N/A N/A		Table 509 Table 509	Compliance: All new construction elements, compo Exceptions: The length of dead-end corridors in t	nents, systems, and spaces shall comply with newly constructed spaces shall only be require	the requirements of the IBC red to comply with the provisions	of section 805.6
	Group I-2 waste and linen rooms Waste and Linen Collection Room > 100 sf	1 hr 1hr or Auto Suppress	N/A N/A		Table 509 Table 509	Existing vertical openings:	iewry constructed spaces snan onry oe requi	ee to comply with the provisions	No existing vo
	Stationary Battery Storage	1 hr in Group B,F,M,S & U 2 hr in Group A, E, I & R	N/A N/A		Table 509 Table 509	Corridor Rating: Where an approvide sprinkler syste	em is installed throughout the story, the requi	red fire resistance rating	Existing Corr
	Rooms with fire pumps - nonhigh-rise Rooms with fire pumps - high-rise	2 hr or 1 hr & Auto Suppress 2 hr	N/A N/A		Table 509 Table 509	of any corridorlocated on the story shall be permi Automatic sprinkler systems shall be provided in B	itted to be reduced in accordance with the IB use where work areas have exits or corridors	C. shared by	changed
	Electrical installations and trasnformers	See Sections 110.26 through 110.34 and sections 450 8 through 450 38	4 N/A		Table 509	more than one tenant or serve an occupant load g Fire Alarm and Detection: An approved fire alarm sy	reater than 30 persons. stem shall be installed in accordance with So	eciton 803.4.1 through 803.4.3	Existing Spri
		of NFPA 70 for protection and separation requirments				Smoke detection: Automatic fire detactors shall be su	noke detectors.		
	Fire Barriers	2 hr	N/A		Table 707 2 10	Every story utilized for human occupancy on which t	there is a work area that includes exits or cor	ridors shared by more than one	Existing mean
	Continuity Supporting Construction	Continuous through concealed spac	Evicting model (1)	nbly is to normal-	707.5 707.5	in accordance with the IBC in addition, the exists	shall comply with Section 805.3.1.1 and 805	5.3.1.2.	u
	Supporting Construction	2 nr	Existing, rated floor assen	noty is to remain	/0/.3.1	Level 2 alterations to existing buildigns or structure	ares do not require the entire building or stru	cture to comply with the energy	
	Fire Separation Assemblies Fire Areas	NA	NA		Table 707.3.10	requirements of the IECC. The alterations shall co construction only.	morm to the energy requriements of the IEC	c as they relate to new	
	vertical Exit Enclosure Less than 4 stories	1 hr.	N/A		1023.2, 707.3, 708.4	Chapter 9 - Alteration Level 3 Not Applicable, less than 50% of area or floor Chapter 10 - Chapter 6 Oc			
	4 or more stories Exit Passageway	2 hr 1 hr or 2 hr, not less than connecting	N/A g · N/A		1023.2, 707.3 707.3.3, 1023.2	Not deemed a change of use, current use B			
	Shafts Less than 4 stories	1 hr.	N/A		708.4				
	4 or more stories Other Separation Assemblies	2 hr See separation protection	N/A		708.4	LIFE SAFETY CODE			
	Fire Partitions	above			407.2		CODE		
	Corridor Fire Resistance Rating Serving > 10 persons	Corridor walls to be constructed as Use B: 0 hr w\ sprinkler	smoke partitions 0 hr required		407.3 Table 1020.1	LIFE SAFETY CODE Magne of Emerge Community	CODE Required		
	Serving < 10 persons Smoke Partitions	Use B: 0 hr w\ sprinkler Not Required	N/A Not Required		710	Stair Standards- New Stairs	Permitted per 7.2.2 (1)		
	Opening Protectives Fire walls & Fire Barriers having	4 hr	3 hr	N/A	Table 716.1(2)	Clear Width	44" 36" Occ < 50	N/A N/A	
	Assemblies > 1hr	3 hr 2 hr	3 hr 1 1/2 hr	N/A N/A	Table 716.1(2) Table 716.1(2)	Min. / Max. height of risers Min. tread depth	4" / 7" 11"	N/A N/A	
	Fire barriers of 1-hour fire-resistance-rated:	1 1/2 hr		N/A	Table 716.1(2) Table 716.1(2)	Min. Headroom Max. Height between landings	6'-8" 12'-0"	N/A N/A	
	Shaft and Exit Encl. Walls Other Fire Sep. Assemblies	1 hr 1 hr	1 hr 3/4 hr	N/A N/A	Table 716.1(2) Table 716.1(2)	Stair Standards - Existing to remain Clear Width	Permitted per 7.2.2 (2) 36"	N/A N/A	
	Fire Partitions: Corridor walls	1 hr	1/3 hr	N/A	Table 716.1(2) Table 716.1(2)	Min. / Max. height of risers	8 1/4"	N/A	
	Other Fire Partitions	.5 hr 1 hr	1/3 hr 3/4 hr	N/A N/A	Table 716.1(2) Table 716.1(2)	Min. tread depth Min. Headroom	9" 6'-8"	N/A N/A	
	Exterior Walls	.5 hr 3 hr	1/3 hr 1-1/2hr	N/A N/A	Table 716.1(2) Table 716 1(2)	Max. Height between landings Ramp Standards	12'-0" Permitted complying with 7.2.5	N/A 5 N/A	
	LAUTOL WAILS	2 hr	1-1/211 1-1/2hr 3/4 hr	N/A N/A	Table 716.1(2) Table 716.1(2)	Clear Width	44", 4 1/2" max. projection eac	h side N/A	
·	Smoke Barriers	1 nr. 1 hr	5/4 nr 1/3 hr	IN/A N/A	Table 716.1(2) Table 716.1(2)	Max. Stope Max. Cross Slope May Disc with set here it	1 in 12 1 in 48 20"	IN/A N/A N/A	
	With Sprinkler:	P		в	Table 002.12	Means of Egress Width & Height	3U -	N/A	``
	Req d. vert. Exits & Passageways Corridors Providing Exit Access	в С С		в С С	Table 803.13 Table 803.13	Min. Door Height	32" 80" 71 4"	> 52" (56" leaf = 33 1/2" 84" door height	,
	Rooms and Enclosed Spaces Floor Finish @ vert. exits,	C Pill Test		C Pill Test	1 able 803.13 804.4.1	Area of Refuge	Per 7.2.12 unless sprinklers	>/'-0'' N/A	
	Exit passageways Without Sprinkler:	Class 2		Class 2	804.4.2 ex. Table 803.13	Capacity of Means of Egress Corridor Width	36" min	N/A	
	Req'd. Vert. Exits & Passageways Corridors Providing Exit Access	N/A N/A		N/A N/A	Table 803.13 Table 803.14	Stairs Ramps & Corridors	0.3 per person 0.2 per person	N/A N/A	
	Rooms or Enclosed Spaces Floor Finish @ vert. exits,	N/A N/A		N/A N/A	Table 803.15 804.4.2	Doors Number of Exits	32" clear, 0.2"pp	33 1/2" = 160 persons	
3	Fire Protection Systems Automatic Fire Suppression System		Provided, Existing		903	Min. Number of Exits	2 per story	N/A	
	Fire Extinguishers Monitoring System not required in existing buildings	/ renovations	Provided, Existing Not Provided		906.1	Arrangement of Means of Egress Dead end Corridor w/Sprinkler			
١	Fire Alarm System: Means of Egress		Provided, Existing		907.2.2 1003	B Travel Distance w/ Sprinkler	50 ft	See Code Plans	
	Capacity of Means of Egress Stairs	0.3" per person	N/A		1005.3.1	B Common Path w/ Sprinkler	300 ft	See Code Plans	
	Ramps & Corridors Doors	0.2" per person 0.2" per person	N/A 42'' = 210		1005.3.2 1005.3.2	B Emergency Lighting	100 ft Required	See Code Plans Provided	
	Doors Min. Width	32" Min. clear width	>32''	34 minimum	1010.1.1	Required Fire Resistance Rating Enclosures connecting 4 or more stories in New Con	struction	2 hr	N/A
	Max Width Min Height	48" Max. clear width 80" Min height	<48'' >80''	44" leaf maximum 7'-0" provided		Other enclosures in new construction Existing enclosures in existing buildings		 1 hr 1/2 hr	N/A N/A
	Panic Hardware Stairs	A-3 > 50 persons	N/A	N/A with 17 persons	1010.1.9.4	Exit Enclosures Connecting 3 stories or less		1 hr with Ontion 4	N/A
	Min. Width Min. Width Accessible Stair	44" (36" if 50 Occ or Less) 48" (between bandroils required)	N/A N/A		1011.2 1009 3 2	Doors to be 1 3/4" solid core doors, self closin Connecting 4 stories or more in existing constant	ng and self latching tion w/ sprinkler system	1 hr	N/A
	Headroom Stair Tread & Risers	80" Min.	N/A		1011.3	Connecting 4 stories or more in new construction	l	2 hr 2 hr 0 hr with sprinklas	N/A N/A
	Treads Risers	11" Min. 4" Min - 7" Max	N/A N/A		1011.5.2	Opening Protection	2 hr	1 1/2 hr	17/A
	Risers Handrails Handrail Francis	4 IVIII/" Max 34" to 38" AFF	IN/A N/A N/A		1011.5.2 1011.11	2nr nre barrier 1 hr fire barrier	2 nr	1 1/2 Nr	N/A
	Handrall Extensions Clearance to Wall	12° norz trom top & bottom risers 1 1/2"	N/A N/A		1014.6 1014.7	vertical openings & exit encl. other barriers	1 nr 3/4 hr	1 nr 3/4 hr	N/A N/A
	Ramps Max. Slope	1:12	N/A		1012.2	1/2 hr fire barrier Exit Access Corridors	20 min. 1 hr	20 min. 1/3 hr	N/A N/A
	Max. Cross Slope Min. Clearance	1:48 36" between handrails	N/A N/A		1012.3 1012.5	Smoke Barriers	1/2 hr 1 hr	1/3 hr 1/3 hr	N/A N/A
	Headroom Landing Width	80" Min. Equal to Ramp Width	N/A N/A		1012.5.2 1012.6.2	Smoke Partitions	1/2 hr	1/3 hr	N/A
	Handrails Req'd @ >6" rise	Required Required	N/A N/A		1012.8 1012.10	Interior Finishes Business			
	Edge Protection	Required	N/A		1012.9	Exits Exit Access Corridors	A or B A or B		
	Edge Protection Guards Exit Access		2		Table 1006.3.2	Other Spaces Notes:	A B, Or C		
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit. Required Exits	2 N/A	N/A		1007.1	Class A: Interior and ceiling finish - flame spread inc Class B: Interior and ceiling finish - flame spread inc	lex, 0-25, (new applications); smoke develop lex, 26-75, (new applications); smoke develo	oment index, 0-450	
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr)	2 N/A N/A 1/3 diagonal distance	N/A N/A >1/3			Class C: Interior and ceiling finish - flame spread ind	, == , e, (ie., applications), shoke develo		
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinklar system)	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance	N/A N/A >1/3 N/A		1007.1.1 ex2 Table 1006.2.1	6 I	dex, 76-200, (new applications); smoke devel	lopment index, 0-450	
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system)	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100	N/A N/A >1/3 N/A See Code Plan		1007.1.1 ex2 Table 1006.2.1	Detection, Alarm & Notification	lex, 76-200, (new applications); smoke devel	Existing system	Deco-1
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200	N/A N/A >1/3 N/A See Code Plan See Code Plan		1007.1.1 ex2 Table 1006.2.1 Table 1017.2	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements	lex, 76-200, (new applications); smoke devel Required	Existing system	Provide
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants (50 Occupants	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 26" Mir.	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required	lex, 76-200, (new applications); smoke devel Required	Existing system	Provide Provide
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants Corridor Rating	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min.	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 1020.2.2 Table 1020.1	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required STANDARD ON FIRE PROTEC	lex, 76-200, (new applications); smoke devel Required	Existing system Existing system EXISTING CHE	Provided Provided MICALS
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants Corridor Rating without sprinkler with sprinkler	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min. 1 hr. 0 hr	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A N/A		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 1020.2.2 Table 1020.1	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required STANDARD ON FIRE PROTEC 2015 NFPA 45	Iex, 76-200, (new applications); smoke devel Required	Iopment index, 0-450 Existing system Existing system	Provided Provided MICALS
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants <50 Occupants Corridor Rating without sprinkler with sprinkler Dead End Corridors B	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min. 1 hr. 0 hr 50' Max w/ sprinkler	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A N/A N/A		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 Table 1020.1	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required STANDARD ON FIRE PROTECTION FOR LABOR USING CHEMICALS	lex, 76-200, (new applications); smoke devel Required CTION FOR LABORATO CODE RATORIES	Existing system Existing system EXISTING CHE	Provided Provided MICALS
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants <50 Occupants Corridor Rating without sprinkler bead End Corridors B Minimum Number of Exits 1 to 500 persons	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min. 1 hr. 0 hr 50' Max w/ sprinkler 2	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A N/A N/A N/A		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 1020.2.2 Table 1020.1 1020.4 ex.2 Table 1006.3.1 Table 1006.3.1	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required 2015 NFPA 45 STANDARD ON FIRE PROTECTION FOR LABOR USING CHEMICALS Laboratory Unit Hazard Classification Additional Requirements for Educational Instruction	lex, 76-200, (new applications); smoke devel Required CTION FOR LABORATO CODE RATORIES al Laboratory Units.	Existing system Existing system RIES USING CHE	Provided Provided MICALS
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants <50 Occupants Corridor Rating without sprinkler with sprinkler Dead End Corridors B Minimum Number of Exits 1 to 500 persons .ccessibility Requirements	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min. 1 hr. 0 hr 50' Max w/ sprinkler 2 To follow section 3411	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A N/A N/A N/A N/A N/A To be provided		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 1020.2.2 Table 1020.1 1020.4 ex.2 Table 1006.3.1 Table 1006.3.1 1103.2.2	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required STANDARD ON FIRE PROTECTION 2015 NFPA 45 STANDARD ON FIRE PROTECTION FOR LABOR USING CHEMICALS Laboratory Unit Hazard Classification Additional Requirements for Educational Instruction Instructional laboratory units shall be classified a laboratory Unit Design and Construction	lex, 76-200, (new applications); smoke devel Required CTION FOR LABORATO CODE RATORIES al Laboratory Units. as Class C or Class D laboratory units.	Existing system Existing system EXISTING CHE	Provided Provided MICALS
	Edge Protection Guards Exit Access Minimum Number of Exits Spaces with One Exit, Required Exits Maximum Occupant Load Exit Separation (w spklr) Exit Separation (w/o spklr) Common Path of Travel (with sprinkler system) B Exit Access Travel Distance (with sprinkler system) B Corridor Width >50 Occupants <50 Occupants <50 Occupants Corridor Rating without sprinkler bead End Corridors B Minimum Number of Exits 1 to 500 persons Accessibility Requirements Accessible Entrances	2 N/A N/A 1/3 diagonal distance 1/2 diagonal distance 100 200 44" Min. 36" Min. 1 hr. 0 hr 50' Max w/ sprinkler 2 To follow section 3411 Shall be provided per 1105	N/A N/A >1/3 N/A See Code Plan See Code Plan Provided, Existing N/A N/A N/A N/A N/A N/A N/A N/A		1007.1.1 ex2 Table 1006.2.1 Table 1017.2 1020.2 1020.2 Table 1020.1 1020.4 ex.2 Table 1006.3.1 Table 1006.3.1 1103.2.2 1105.1	Detection, Alarm & Notification Fire Alarm/Auto Detection System Extinguishment Requirements NFPA 13 system required STANDARD ON FIRE PROTECTION FOR LABOR USING CHEMICALS Laboratory Unit Hazard Classification Additional Requirements for Educational Instruction Instructional laboratory units shall be classified a laboratory Unit Design and Construction The required construction of laboratory units shall be Laboratory Unit (classification) Area	Iex, 76-200, (new applications); smoke devel Required CTION FOR LABORATO CODE RATORIES al Laboratory Units. as Class C or Class D laboratory units. e in accordance with Table 5.1.1 of Lab Fire Separation	Permited Sotries above grade	Provided Provided MICALS

		С		
RNATIONAL EXISTING BUIL	DING CODE 2018			
ernational Existing Building Code	CODE			REFERENCE
0 0 I	Required/Allowed		Proposed	
rea includes first floor lab rooms 127, 155, and second the Existing Building Code 2018, Rooms 155 and areas in question have ADA compliant facilities an	nd floor lab rooms 203 and 224 of 203 are Level 2 Alteration, and ro d entrances and the egress system	an existing type 2B building. The oms 127 and 224 are level 1 Alter from the new spaces meets IBC 2	re are no changes in use. ations. 018.	
nce Method				301 3 2
 6 - Classification of Work a does NOT exceeds 50% of the building, therefore Less not a change in occupancy remaining B 	vel 1 and 2 alteration, therefore it m	ust comply with chapter 7 & 8.		602, 603
ling is sprinklered				
or Finishes - All newly installed interior wall and ceil or Floor Finishes - All newly installed interior floor fi protection	ing finishes shall comply with chapt nishes shall comply with Section 80-	er 8 of IBC 2018 4 of IBC 2018		702.1 702.2 703
Iterations shall be done in a manner that maintains the of Egress	e level of fire protection provided			704
Iterations shall be done in a manner that maintains the	e level of proteciton provided for the	means of egress		707
evel 1 alterations to existing buildigns or structures de equiremtns of the IECC. The alterations shall conform onstruction only.	o not require the entire building or stu- to the energy requriemsnts of the IE	ructure to comply with the energy CC as they relate to new		/0/
8 - Alterations - Level 2 pliance: All new construction elements, components, exceptions: The length of dead-end corridors in newly ing vertical openings:	systems, and spaces shall comply wi constructed spaces shall only be requ	th the requirements of the IBC aired to comply with the provisions of	of section 805.6 No existing vertical openings	801.2
Protection		· 10· ·		803
dor Rating: Where an approvide sprinkler system is it f any corridorlocated on the story shall be permitted to	nstalled throughout the story, the req	uired fire resistance rating	Existing Corridors not changed	803.1.1
matic sprinkler systems shall be provided in B use wh	here work areas have exits or corrido	rs shared by		803.2.2
nore than one tenant or serve an occupant load greater	than 30 persons.		Existing Sprinklers	
Alarm and Detection: An approved fire alarm system s	shall be installed in accordance with	Seciton 803.4.1 through 803.4.3		803.4
ns of egress	letectors.			805
y story utilized for human occupancy on which there is enant within the work area shall be provieded with the a accordance with the IBC in addition, the exists shall of any Conservation	s a work area that includes exits or cominimum number of exits based on comply with Section 805.3.1.1 and 8	orridors shared by more than one the occupancy and the occupant load 05.3.1.2.	Existing means of Egress	805.3.1
evel 2 alterations to existing buildigns or structures de equiremtns of the IECC. The alterations shall conform	o not require the entire building or str to the energy requriemsnts of the IE	ructure to comply with the energy CC as they relate to new		810
onstruction only. 9 - Alteration Level 3				
Applicable, less than 50% of area or floor				
leemed a change of use, current use B				
SAFETY CODE				
PA 101	CODE			REFERENCE
FETY CODE	Required			
Standards- New Stairs	Permitted per 7.2.2 (1)			7.2.2
Clear Width	44"	N/A		Table 7.2.2.1(a),
	36" Occ < 50	N/A		7.2.2.1.(a)
Ain. / Max. height of risers	4" / 7"	N/A		Table 7.2.2.1(a)
ani. tread depth Jin Headroom	11 6'-8"	IN/A N/A		Table 7.2.2.2.1(a) Table 7.2.2.2.1(a)
fax. Height between landings	12'-0"	N/A		Table 7.2.2.2.1(a) Table 7.2.2.2.1(a)
Standards - Existing to remain	Permitted per 7.2.2 (2)	N/A		7.2.2
Clear Width	36"	N/A		Table 7.2.2.1(a),

Provided

Provided

D PROJECT LOCATION MAP		E	
	SIGN	Winter Street Fam	
		6" DIA. LOGO	
	PROJECT NAME-	3" PROJECT NAME, BOLD 2" ADDRESS, PLAIN	PLAN KEY:
	PROJECT ADDRESS		
		1-3/4" TITLE, PLAIN	
	STREET ADDRESS	2" NAME, BOLD 1-3/4" ADDRESS. PLAIN	
	CITY, STATE TELEPHONE		
		1-1/8" TITLE, PLAIN	
	ARCHITECT: WARRENSTREET ARCHITECTS, INC.	1-1/8" NAME, BOLD	
	CIVIL:		RENOVATIONS
	FINANCING:	1" TITLE, PLAIN, TYPICAL	
	BANK NAME - STREET ADDRESS CITY, STATE TELEPHONE	1" NAME, BOLD 1" ADDRESS, PLAIN	1 COLLEGE PLACE CLAREMONT NH 03743
		1" TITLE, PLAIN, TYPICAL 1" NAME, BOLD	
GEN 1. C 2. P 3. M 4. A P	NERAL NOTES: CITY, STATE TELEPHONE CONSTRUCT SIGN PANEL FROM 4' x 8' EXTERIOR GRADE DFPA A-A PLYWOOD. VAINT (BACKGROUND) TWO SIDES OF PANEL, COLOR: WHITE. PRINT TO BE ON MOUNT PANEL ON (2) 4x4 PRESSURE TREATED POSTS, 36" ABOVE GRADE. CQUIRE OWNER, ARCHITECT, BUILDING INSPECTOR APPROVAL OF BOTH CO PRIOR TO CONSTRUCTION.	1" ADDRESS, PLAIN IE COLOR: BLACK. PY AND LOCATION	SCALE: AS NOTED DWN BY: Author
NH APPLICABLE CODES			JOB #: 3773 CHK BY: Checker
 NEW HAMFSHIRE STATE BOILDING CODE. I INTERNATIONAL BUILDING CODE (IBC) - NEW HAMPSHIRE SAF-C 6008 BUILDING SA NFPA 1 UNIFORM FIRE CODE - 2018 EDI NFPA 101 LIFE SAFETY CODE - 2018 EDI ADA STANDARDS FOR ACCESSIBLE DESIGI ANSUCC A117.1 ACCESSIBLE DASIBLE DESIGI 	- 2018 EDITION, AS AMENDED - 2018 EDITION, AS AMENDED FETY CODE TION TION INTERNATIONAL ENERGY NATIONAL PLUMBIN NATIONAL ELECTRICAL C NATIONAL ELECTRICAL C NATIONAL ELECTRICAL C	IG CODE (IPC) - 2018 EDITION ICAL CODE (IMC) - 2018 EDITION ODE (NEC), NFPA 70 - 2017 EDITION	PRINT DATE: 4/6/2023 1:53:46 PM ISSUE DATE: 1000000000000000000000000000000000000
CODE REVIEW GENERAL	NOTES		FOR CONSTRUCTION
PROJECT SUMMARY			REVISION DATE COMMENTS
ARCHITECTURAL, MECHANICAL AND ELECTRIC DOORS & HM FRAMES, PARTITION FRAMING, F FLOOR FINISHES.	CAL. THE GENERAL CONSTRUCTION INCLUDES STEEL FRAMING, PAINTING, WOOD DOORS, HARDWARE, CEILINGS, MILLWORK AND		
REGULATORY REQUIREMENTS AT I THESE PLANS WERE DESIGNED AND TO THE E TIME THE PLANS WERE DRAWN. SUBSEQUEN REVIEWED FOR CONFORMITY TO ANY CHANG REGULATIONS AND REFERENCED STANDARDS BUILDING OFFICIAL SHALL BE BINDING ON THE PLUMBING CODES AND ALL OTHER APPLICABL EXTENT OF THE WORK IS DESCRIBED IN THE INCLUDING THE GENERAL AND SUPPLEMENTA DRAWING PACKAGE. FIRE PROTECTION SYSTEM	DRAWING ISSUE DATE BEST OF OUR KNOWLEDGE CONFORM WITH THE BUILDING CODES APPLICABI TLY, SHOULD THE CONSTRUCTION OF THE BUILDING BE DELAYED BEYOND IN ES IN LOCAL AND NATIONAL CODE REQUIREMENTS. IN THE EVENT OF A CON S OF THESE PLANS AND SPECIFICATIONS, THE MORE STRINGENT PROVISION E DESIGNER. ALL WORK SHALL COMPLY WITH FEDERAL, STATE AND LOCAL E LE CODES, REGULATIONS, AND ORDINANCES INCLUDING THE REQUIREMENT CONTRACT DOCUMENTS WHICH INCLUDE THE DRAWINGS, SPECIFICATIONS, AL CONDITIONS AND OTHER DIVISION ONE SPECIFICATION SECTIONS. THE D	LE TO THE PROJECT'S LOCALITY IN EFFECT AT THE MMEDIATE PERMITTING, THESE PLANS SHOULD BE IFLICT BETWEEN APPLICABLE CODES AND I SHALL GOVERN. NO VARIATION REQUIRED BY A BUILDING, FIRE, ELECTRICAL, MECHANICAL, AND S OF THE AMERICANS WITH DISABILITIES ACT. THE AND THE GENERAL PROVISIONS OF THE CONTRACT RAWINGS ARE LISTED ON THE COVER SHEET OF THE	CODE REVIEW
CONTRACTOR SHALL PROVIDE P.E. STAMP PROVIDE COVERAGE IN ALL CONCEALED S THE END PROTECTION OVERTICAL STATEMENTS	PED DESIGN FOR REVIEW AND APPROVAL OF CODE ENFORCEMENT AUTHOR SPACES INCLUDING BUT NOT LIMITED TO ABOVE CEILINGS.	ITIES UNLESS NOTED OTHERWISE.	
 THE FIRE PROTECTION SYSTEM SHALL BE FIRE ALARM SYSTEM CONTRACTOR SHALL SUPPLY, INSTALL, AN OWNER SHALL BE ONLY RESPONSIBLE FOI 2. ACTIVATION OF THE FIRE ALARM IN ALL "A SYSTEM 	MONITORED BY AN APPROVED SUPERVISING STATION IN ACCORDANCE WIT ND PROVIDE ALL COORDINATION OF ANY AND ALL TELEPHONE LINES REQUIR R MONTHLY CARRIER FEES. SYSTEM SHALL BE APPROVED BY LOCAL MUNIC SSEMBLY" SPACES GREATER THAN 300 OCCUPANTS SHALL INITIATE USING A	H NEPA 72. RED TO PLACE SYSTEM INTO OPERATION. THE CIPALITY. AN EMERGENCY VOICE/ALARM COMMUNICATIONS	SHEET NUMBER: 2 OF 10 ARCHITECTURAL THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SQLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE
D		E	PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW. Copyright Warrenstreet Architects, Inc. © 1990 - 2022

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PROJECT ADDRESS	3" PROJECT NAME, BOLD 2" ADDRESS, PLAIN	PLAN KEY:
OWNER:- OWNER NAME- STREET ADDRESS- CITY, STATE TELEPHONE	1-3/4" TITLE, PLAIN 2" NAME, BOLD 1-3/4" ADDRESS, PLAIN	
	1-1/8" TITLE, PLAIN	
STRUCTURAL: MEP:		PROJECT TITLE / ADDRESS: RVCC LAB
FINANCING:	1" TITLE, PLAIN, TYPICAL	RENOVATIONS
BANK NAME	1" NAME, BOLD 1" ADDRESS, PLAIN	1 COLLEGE PLACE CLAREMONT NH 03743
CONTRACTOR: - CONTRACTOR NAME - STREET ADDRESS CITY, STATE TELEPHONE ENERAL NOTES: CONSTRUCT SIGN PANEL FROM 4' x 8' EXTERIOR GRADE DFPA A-A PLYWOO PAINT (BACKGROUND) TWO SIDES OF PANEL, COLOR: WHITE. PRINT TO BE MOUNT PANEL ON (2) 4x4 PRESSURE TREATED POSTS, 36" ABOVE GRADE. ACQUIRE OWNER ARCHITECT BUILDING INSPECTOR APPROVAL OF BOTH (D. D. D. Color: Black.	JONATHAN W. SMITH NO. 3418
PRIOR TO CONSTRUCTION.		SCALE: AS NOTED DWN BY: Author
E: RSA 155-A:1 INTERNATIONAL ENERGY - 2018 EDITION, AS AMENDED AFETY CODE INTERNATIONAL MECH	BY CONSERVATION CODE (IECC) - 2018 EDITION BING CODE (IPC) - 2018 EDITION ANICAL CODE (IMC) - 2018 EDITION	JOB #: 3773 CHK BY: Checker PRINT DATE: 4/6/2023 1:53:46 PM
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AND PROVIDE ALL COORDINATION OF ANY AND ALL TELEPHONE LINES REQUOR MONTHLY CARRIER FEES. SYSTEM SHALL BE APPROVED BY LOCAL MUN "ASSEMBLY" SPACES GREATER THAN 300 OCCUPANTS SHALL INITIATE USING	IIRED TO PLACE SYSTEM INTO OPERATION. THE IICIPALITY. 3 AN EMERGENCY VOICE/ALARM COMMUNICATIONS	SHEET NUMBER: 2 OF 10 ARCHITECTURAL THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS
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REFERENCE

Table 7.2.2.1(a) NH

Amendment 24.2.5.1.4 Amendment 24.2.5.1.4

Table 7.2.2.1(a)

Table 7.2.2.1(a)

Table 7.2.5.2 (a) Table 7.2.5.2 (a)

Table 7.2.5.2 (a)

Table 7.2.5.2 (a)

7.2.1.2.4 7.2.1.2.2

7.1.5

7.2.12.1.2

7.3.3.1

39.2.4, 39.2.6

Table A.7.6

Table A.7.6

Table A.7.6

7.8.1.1

8.6.5

8.6.5

8.6.5

31.2.2.1.2

31.2.2.1.3

7.1.3.2.1 (2b)

7.1.3.2.1 (2)

Table 8.3.4.2

Table A.10.2.2

18.2.6.2.2; 38.3.6.1 ex1

7.3.1.4, 7.3.4.1, 38.2.3.2 Table 7.3.3.1, 7.3.3.1

Table 7.3.3.1, 7.3.3.1

Chapter 4
4.2.2
4.2.2.1
Chapter 5

Permited Sotries above grade	
1 to 3	0 hr rating provided
No limit	









DEMO REFLECTED CEILING PLAN - ROOM 224 A201 | 1/8" = 1'-0"



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SEE SHE ENLARG

HEET A403 FOR GED PLAN					
	4 A201	FLOOR PLAN - ROOM #224 1/8" = 1'-0"			
		1	С		D

 2
 REFLECTED CEILING PLAN - ROOM #224

 A201
 1/8" = 1'-0"

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8'-3" AFF	

		E	
	GENERAL PLAN NOTES	RCP GENERAL NOTES	
	 ARCHITECTURAL DATUM = 100'-0". THE ARCHITECTURAL DATUM IS INDEPENDENT OF ELEVATIONS SHOWN ON THE CIVIL DRAWINGS. SEE CIVIL DRAWINGS FOR CORRESPONDING DATUM IN HEIGHT ABOVE SEA LEVEL. ALL DIMENSIONS AT NEW WALLS ARE TO OUTSIDE FACE OF STUD, FACE OF CONCRETE, FACE OF MASONRY, OR CENTER OF OPENING, U.N.O. AT EXISTING WALLS DIMENSIONS ARE TO FINISH FACE OF WALL. DO NOT SCALE DRAWINGS. CONTACT ARCHITECT FOR ANY DISCREPANCY PRIOR TO COMMENCING WITH ANY WORK. REFER TO DIMENSION PLANS FOR GENERAL PARTITION NOTES & PARTITION TYPES. VERIFY FIELD CONDITIONS PRIOR TO COMMENCEMENT OF EACH PORTION OF THE WORK. NOTIFY ARCHITECT OF DISCREPANCIES. ALL LUMBER IN DIRECT CONTACT WITH CONCRETE SHALL BE PRESSURE TREATED INCLUDING ALL SILL PLATES FOR WOOD STUD WALLS. REVIEW PRIOR TO INSTALLATION, ANY CONFLICT OF ENGINEERING TRADE DEVICES (I.E. FIRE ALARM STROBES) WITH ARCHITECTURAL DETAILS AND BRING THOSE DISCREPANCIES TO THE ARCHITECT FOR REVIEW. PROVIDE BLOCKING FOR MILLWORK, MECHANICAL FIXTURES, PLUMBING FIXTURES AND OTHER ITEMS IDENTIFIED IN THE CONSTRUCTION DOCUMENTS. COORDINATE MISC. STEEL REQUIREMENTS FOR MOUNTING / HANGING OWNER SUPPLIED EQUIPMENT. 	 LIGHT FIXTURE AND MECHANICAL DEVICE LOCATIONS ARE SHOWN FOR ARRANGEMENT PURPOSES ONLY. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURES TYPES. SEE WINDOW HEAD DETAILS FOR CEILING CONDITIONS AT WINDOWS. SEE STRUCTURAL DRAWINGS FOR SEISMIC DESIGN CATEGORY FOR CEILING SUSPENSION SYSTEM. CONTACT FACILITIES TO DETERMINE ASPESTOS LOCATIONS AND TAKE ALL PRECAUTIONS TO ENSURE SAFE AND LEGAL CONTAINMENT AND DISPOSAL. RCP ANNOTATION LEGEND A KEYNOTE, SEE RCP KEYNOTE LEGEND STRUCTURAL GRID LINE NEW CONSTRUCTION EXISTING CONSTRUCTION TO REMAIN CEILING TAG CX FF CEILING TYPE DESIGNATION, SEE CEILING TYPES LEGEND CEILING HEIGHT, ABOVE FINISHED FLOOR RCP CEILING TYPES DESCRIPTION / BASIS OF DESIGN C1 - 2'x2' ACT - ARMSTRONG DUNE #1853 	
	FLOOR PLAN LEGEND	15/16" GRID - ANGLED TEGULAR COLOR: WHITE	
	101 DOOR TAG, SEE 101 DOOR SCHEDULE Image: Image		PLAN KEY:
	EXISTING DOOR		
	FLOOR PLAN KEYNOTES	FIXTURE LEGEND	
	KEY #DESCRIPTION1BLIND CORNER CABINET2PHLEBOTOMY PRACTICE AREA3EXISTING AUTOCLAVE4EXISTING INCUBATOR5EXISTING ICE MAKER6EXISTING LAB OVEN7EXISTING HAZARDOUS MATERIALS CABINET - INORGANIC ACIDS; 51CM W X 79 CM L X 93 CM H.8EXISTING HAZARDOUS MATERIALS CABINET - ORGANIC ACIDS; 46 CM W X 59 CM L X 90 CM H. HAS VENTILATION PORTS9EXISTING HAZARDOUS MATERIALS CABINET - ORGANIC ACIDS; 46 CM W X 59 CM L X 90 CM H. HAS VENTILATION PORTS9EXISTING HAZARDOUS MATERIALS CABINET - ORGANIC ACIDS; 46 CM W X 59 CM L X 90 CM L X 82CM H. NO VISIBLE VENTILATION PORTS.10EXISTING HAZARDOUS MATERIALS CABINET - FLAMMABLE LIQUIDS - 56CM W X 90 CM L X 82CM H. NO VISIBLE VENTILATION PORTS.11EXISTING HAZARDOUS MATERIALS CABINET - CORROSIVES ; 40CM W X 43 CM L X 54 CM H (QTY. 2) NO VENTILATION PORTS.11EXISTING FUME HOOD - RELOCATED12RELOCATED EXISTING REFRIGERATOR13RELOCATED EXISTING UNDER-COUNTER REFRIGERATOR14PROJECTION SCREEN OR SMARTBOARD15FUME HOOD - DUAL SIDED16LWS 1 ADJUSTABLE-HEIGHT LAB TABLE WITH SINK, GAS & ELECTRIC.(8 OUTLETS)17CASEWORK18SAFETY SHOWER/ EYE - WASH19SINK LOCATION20GAS LOCATION	TROFFER AND RECESSED LIGHT FIXTURES Image: Colspan="2">24" X 24" TROFFER Image: Colspan="2">LIGHT FIXTURE Image: Colspan="2">Colspan="2">Colspan="2">Colspan="2" Image: Colspan="2">Colspan="2" Image: Colspan="2" Colspan="2" I	IST FLOOR PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
	21 LWS 2 ADJUSTABLE-HEIGHT LAB TABLE WITH ELECTRIC (8 OUTLETS)		SCALE: AS NOTED DWN BY: RH
	22 GOGGLE SANITIZING UNIT 23 COAT HOOKS (QTY. 20-24)	MECHANICAL REGISTERS AND GRILLES	JOB #: 3773 CHK BY: JS
	24 MOBILE TEACHER LECTURN 25 SWING DOWN EYE - WASH	SUPPLY AIR DIFFUSER	PRINT DATE: 4/6/2023 1:53:54 PM
	26 MICROSCOPE CABINET 27 WHITEBOARD	RETURN AIR GRILLE OR RECESSED EXHAUST FAN	ISSUE DATE.
	28 CO2 TANK RACK 29 DOOR PANEL AND FRAME EXISTING TO REMAIN REPAINT	RCP KEYNOTES	FOR CONSTRUCTION
	30 REPOUR AREAS OF SLAB WHERE CUTTING TOOK PLACE. 31 MOISTURE RESISITANT GYP. AT SINK	KEY # DESCRIPTION A HEAVY-DUTY PULL-DOWN FUME EXTRACTOR ARMS. LOCATE OVER LAB TABLES B RADIENT HEATING PANELS, SEE MECH. C HVAC UNIT, SEE MECH D PROJECTOR, CEILING MTD. E PROJECTOR SCREEN PULL DOWN	REVISION DATE COMMENTS
			SECOND FLOOR PLAN AND REFLECTED CEILING PLAN
OR			
			SHEET NUMBER: 5 OF 10 ARCHITECTURAL THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET
			ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW





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 GENERAL FINISH NOTES SEE INTERIOR MATERIALS LEGEND FOR FINISH DESIGNATIONS. SEE DOOR SCHEDULE FOR DOOR & FRAME PAINT COLORS. SEE INTERIOR ELEVATIONS ON 'A400' SERIES SHEETS. RESILIENT FLOOR SHALL EXTEND UNDER ALL CASEWORK. ALL ELECTRICAL FIXTURE PLATES AND COVERS SHALL BE WHITE, U.N.O. PAINT METAL STAIR GUARD, HANDRAILS & STRINGERS COLOR, U.O.N. UNDERSIDE GWB OF STAIR SHALL BE PAINTED WHITE, U.O.N. TEST ALL EXISTING AND NEW CONCRETE SLABS FOR MOISTURE VAPOR EMISSIONS (ASTM F1869), INTERNAL RELATIVE HUMIDITY (ASTM 2170), AND ALKALINITY (ASTM F710). IN THE EVENT THAT TEST VALUES EXCEED FLOORING MANUFACTURER'S LIMITS, NOTIFY ARCHITECT TO DETERMINE REMEDIATION METHOD. 	FURNITURE PLAN NOTES 1. NOTE	
	FURNITURE PLAN LEGEND I FURNITURE TAG I FURNITURE TAG I KEYNOTE, SEE FLOOR PLAN KEYNOTE LEGEND STRUCTURAL GRID LINE I NEW CONSTRUCTION EXISTING CONSTRUCTION EXISTING CONSTRUCTION EURNITURE PLAN KEYNOTES DESCRIPTION	
FINISH PLAN LEGEND EINISH PLAN ROOM TAG NAME 101 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 12 12 13 14 15 15 16 17 18 19 11 12 12 12 13 14 15 15 16 17 18 18 18 18 18 18 19 10 10 10 11 12 12 12 13	EQUIPMENT PLAN NOTES 1. NOTE	PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
A KEYNOTE, SEE KEYNOTE LEGEND BELOW FINISH PLAN KEYNOTES KEY # DESCRIPTION A	EQUIPMENT PLAN LEGEND 1t EQUIPMENT TAG A KEYNOTE, SEE FLOOR PLAN KEYNOTE LEGEND STRUCTURAL GRID LINE NEW CONSTRUCTION NEW CONSTRUCTION	SCALE: AS NOTED DWN BY: RH JOB #: 3773 CHK BY: JS
	EXISTING CONSTRUCTION EQUIPMENT PLAN KEYNOTES KEY # DESCRIPTION PHLEBOTOMY PRACTICE AREA EXISTING AUTOCLAVE EXISTING INCUBATOR EXISTING ICE MAKER EXISTING ICE MAKER EXISTING LAB OVEN EXISTING HAZARDOUS MATERIALS CABINET - INORGANIC ACIDS; 51CM W X 79 CM L X 93 CM H. EXISTING HAZARDOUS MATERIALS CABINET - OPEGANIC ACIDS; 46 CM W X 59 CM L X 90 CM H	PRINT DATE: 4/0/2023 1:33:37 PWI ISSUE DATE: FOR CONSTRUCTION REVISION DATE COMMENTS
	 HAS VENTILATION PORTS EXISTING HAZARDOUS MATERIALS CABINET - FLAMMABLE LIQUIDS - 56CM W X 90 CM L X 82CM H. NO VISIBLE VENTILATION PORTS. EXISTING HAZARDOUS MATERIALS CABINET - OCRROSIVES ; 40CM W X 43 CM L X 54 CM H (QTY. 2) NO VENTILATION PORTS. EXISTING FUME HOOD - RELOCATED RELOCATED EXISTING REFRIGERATOR FUME HOOD - DUAL SIDED GOGGLE SANITIZING UNIT CO2 TANK RACK 	SECOND FLOOR FURNITURE/ EQUIPMENT AND FINISH PLAN A1616 SHEET NUMBER: 6 OF 10 ARCHITECTURAL THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE CARDINA DATES OF THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE
 	E	LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW. Copyright Warrenstreet Architects, Inc. © 1990 - 2022







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DR	 PARTITION TYPE NOTES SEE MECHANICAL DRAWINGS FOR FIRE OR SMOKE DAMPER REQUIREMENTS. ALL FIRE RATED AND SMOKE RATED PARTITIONS ARE TO BE IDENTIFIED WITH ADHESIVE LABELS OR STENCILS IN ACCESSIBLE CONCEALED SPACES, SEE PARTITION TYPES AND CODE PLANS FOR LOCATION OF RATED PARTITIONS. ALL WALL FRAMING TO BE MIN. 20 GA. PROVIDE HEAVIER IF REQUIRED FOR BEARING OR DEFLECTION CONDITIONS. PROVIDE MOISTURE RESISTANT GWB ON WALLS & CEILINGS IN ALL BATHROOM, RESTROOM & SHOWER LOCATIONS, & WITHIN 4'-0" OF A SINK, TOILET OR DRINKING FOUNTAIN. 	
	 PROVIDE TILE BACKER BOARD IN LIEU OF GWB AT ALL LOCATIONS TO RECEIVE TILE FINISH. SEE INTERIOR ELEVATIONS, AND FINISH PLANS. INSTALL ALL FIRE RATED WALL AND CEILING ASSEMBLIES FOLLOWING DETAILS, FASTENERS AND SPACING IN ACCORDANCE WITH UL FIRE RESISTANCE DIRECTORY. 	WARRENSTREET ARCHITECTS 27 Warren Street Concord NH 03301
R GLAZING		1 603.223.0040 F 603.225.062 F www.warrenstreet.coop
FRAME N TYPES		OWNER MATT MOORE COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE
DNS & IBMISSION OF		28 COLLEGE DR CONCORD, NH 03301 P. (603) 344 5377 CONSTRUCTION MANAGER MILESTONE ENGINEERING + CONSTRUCTION, INC PO BOX 2279 1 HORSESHOE POND LANE CONCORD, NH 03302 - 2279 P. (603) 226 - 3877
.KGT492		
(FINISH KEY ERENCE.		PLAN KEY:
AFETY GLASS,		
/		
		RVCC LAB
		RENOVATIONS
		1 COLLEGE PLACE CLAREMONT NH 03743
		JONATHAN W. SMITH NO. 3418
		SCALE: AS NOTED DWN BY: RH JOB #: 3773 CHK BY: JS
		PRINT DATE: 4/6/2023 1:54:06 PM ISSUE DATE: FOR CONSTRUCTION
		REVISION DATE COMMENTS
CING		PARTITION TYPES & DOOR SCHEDULE
		A601 SHEET NUMBER: 10 OF 10 ARCHITECTURAL
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MECHANICAL ABBREVIATIONS	MECHANICAL LEGEND	M
	SUPPLY DUCT	
AD ACCESS DOOR	RETURN DUCT	1. DO NOT S
AFG ABOVE FINISHED GRADE	EXHAUST DUCT	I HE FIELL
ALL ACOUSTICALLY LINED APD AIR PRESSURE DROP ATC AUTOMATIC TEMPERATURE CONTROL	GRILLE, REG., DIFF. & LOUVER SYMBOL	2. IT IS NOT SYSTEM 8 OF CONTI
CFM COBIC FEET PER MINUTE C.M. CONSTRUCTION MANAGER EA EXHAUST AIR EAT EXTERNOL OF TEMPERATURE	DIRECTIONAL DIFFUSER INDICATED BY FILL (UN-HATCHED AREAS INDICATE FLOW PATTERN)	3. CONTRAC
EAT ENTERING AIR TEMPERATURE E.C. ELECTRICAL CONTRACTOR EF EXHAUST FAN	SQUARE ELBOW W/TURNING VANES (T.V.)	WITH APP
ESP EXTERNAL STATIC PRESSURE EWT ENTERING WATER TEMPERATURE		MANUFA
FAI FRESH AIR INTAKE FC FLEX CONNECTION		AND OTH PERFORM
FD FIRE DAMPER	SD SMOKE DAMPER	PRODUCT
GPM GALLONS PER MINUTE H.C. HARDWARE CLOTH HP HORSEPOWER		5. CONTRAC JOB SITE.
		AGAINST
MBH THOUSAND BTU'S PER HOUR		6. CONTRAC
MOD MOTOR OPERATED DAMPER M.C. MECHANICAL CONTRACTOR		
N.I.C. NOT IN CONTRACT NTS NOT TO SCALE	24"x12" RECTANGULAR DUCT CLEAR DIMENSIONS	AND DEB
OA OUTSIDE AIR P.C. PLUMBING CONTRACTOR		8. ALL WOR
RA RETURN AIR		EXERCISE
SA SUPPLY AIR	DIRECTION OF FLOW (WATER)	OF TEMP
SCV SELF CONTAINED VALVE SD SMOKE DAMPER	→→→ DIRECTION OF FLOW (AIR)	9. CONTRAC
TOS TOP OF SLAB TSP TOTAL STATIC PRESSURE		END OF E
TYP. TYPICAL U/C UNDER CUT DOOR UH UNIT HEATER	BUTTERFLY VALVE	10. COORDIN REFLECTE
VD VOLUME DAMPER WPD WATER PRESSURE DROP	GATE VALVE	11 WATERPE
WTD WATER TEMPERATURE DROP		
	CIRCUIT SETTER (C.S./SHUTOFF VALVE)	12. ALL ROUG
		13. FIRE AND
	AUTOMATIC CONTROL VALVE (3-WAY)	IN ACCOR
	PRESSURE REDUCING VALVE	14. HOT WAT
	AIR VENT	15. MOUNTIN
	PRESSURE GAUGE	OTHERW
	T T	16. FLEXIBLE
		BENDS TO
		17. PITCH DU
		19. DOCT DIA 20. DROVIDE
	\$ SWITCH	UNITS.
	S SMOKE DETECTOR (FOR EQUIP. SHUTDOWN)	21. PROVIDE
	T THERMOSTAT	
	THERMOSTAT WITH GUARD	22. PROVIDE
	(T) R REVERSE ACTING THERMOSTAT	PIPING, W
	T TEMPERATURE SENSOR	24. INSULATE
	A AQUASTAT	
	CO. CARBON DIOXIDE SENSOR	
	HOT WATER SUPPLY	ALL WOR
	— — HWR— — HOT WATER RETURN	PROPER C
	LIQUID PIPING (REFRIGERANT)	27. CONTRAC
	SUCTION PIPING (REFRIGERANT)	·

			FAN		SCHED	DULE	1										EXF	IAU	ST F
NO.	OUTDOOR UNIT	SERVES	MAKE & MODEL	HEATING BTUH	COOLING BTUH	TONS	CFM	FAN SPEED	VOLTS	EI PH	ECTRIC	AL MCA	МОСР	REMARKS	NO.	AREA SERVED	MAKE & MODEL	CFM	FAN RPM
FC1-1	HP-1	CHEMISTRY LAB 224	TRANE/MITSUBISHI TEFY-P24NMSU	27,000	24,000	2.0	706	HIGH	208	1	60	2.8	15	1	EF-2	PREP ROOM 203A	GREENHECK MODEL CUE-100HP-VG	400	1583
1 REF BOX INS	RIGERANT PIPE WITH ACCESS TALL PER MANU	SIZES SHALL BE PROVIDED DOOR, HIGH EFFICIENCY FII FACTURER'S PUBLISHED IN	D BY THE EQUIPMENT MANUFACTURE LTER AND WALL MOUNTED THERMOS STRUCTIONS.	ER. PROVIDE IND	OOR UNITS W WHERE INDIC	ITH INTEG	RAL CONDE	NSATE LIF	⊥ Γ KIT, DRAIN LL EQUIPM	N PAN LEV IENT REQ	/EL SENS UIRED FO	SOR, RET DR PROP	TURN AIR F PER INSTAL	FILTER LLATION.	EF-5	CHEMISTRY LAB 224	GREENHECK MODEL CUE-100HP-VG	400	1583
																FURNISH WITH VARI-GREEN MOTOR VI HANGING RODS WITH NEOPRENE VIE DAMPER TO OPEN WHEN FAN START	WITH UNIT MOUNTED POTENT 3RATION ISOLATORS AND FIEI 'S AND CLOSE WHEN FAN STC	IOMETER _D INSTA)PS. FUR	R, INTEG LLED M NISHED

В

		
		EXTRACTION ARM SCHEDULE
ER PLAN,	EA-1	MONOXIVENT MNX MINI/LAB ARM - CEILIGNG MOUNT MODEL MNX-1150-C
CEILING		4" EXHAUST CONNECTION 100 CFM NOMINAL AIRFLOW
OF RED TO		FURNISH WITH CEILING MOUNT BRACKET.

D

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MEC	HANI	CAL	SYS	STEN	/IS GENERA	L NOT	ES		W
T SCALE DR	AWINGS. C	ONTRACTO	R SHALL V	ERIFY ALL	DIMENSIONS & CONDITION	S IN			
ELD AND SH OT INTENDE // & COMPC	ALL NOTIFY D THAT THI NENTS SHA	THE ENGIN E DRAWING ALL BE INST	S SHOW I	EDIATELY EVERY PIP CORDING	OF ANY & ALL DISCREPANCI E, FITTING OR MINOR DETAI TO THE INTENT AND MEANII	ES. L. NG			T 603.225.0
ACTOR IS R	ESPONSIBLE RVICES TO I	E TO PROVI MEET REQU		LETE AND	OPERATIONAL SYSTEMS WI ED AND IN ACCORDANCE	ГН			OWNER MATT MOOI COMMUNIT
VENT AND FACTURERS THER CHAR RMANCE AS JCTS IS ON 1	Componen May be co Acteristic Judged B'	NTS HAVING DNSIDERED, S DO NOT (Y THE ENGII ACTOR.	6 EQUAL P , PROVIDE CHANGE D NEER. BUF	PERFORMA D DEVIAT DESIGN CO RDEN OF F	ANCE CHARACTERISTICS BY C IONS IN DIMENSIONS, OPER NCEPT OR INTENDED PROOF OF EQUALITY OF	DTHER ATION			CONCORD, P. (603) 344 CONSTRUC MILESTONE
ACTOR IS R E. OWNER ST FIRE, THE	ESPONSIBLE ASSUMES N FT AND EN	E FOR THE S IO RESPONS VIRONMEN	SAFEKEEPI SIBILITY FO	NG OF HIS OR THE PR DITIONS.	OWN PROPERTY ON THE OTECTION OF PROPERTIES				PO BOX 227 1 HORSESH CONCORD, P. (603) 226
ACTOR IS R INJURY, AN	ESPONSIBLI D DAMAGE	E TO PROPE TO SAME S	RLY PROT	ECT OWN	ER'S PROPERTY AND EQUIPM BY CONTRACTOR.	/IENT			
ACTOR IS T EBRIS CAUS	O CLEAN JO ED BY THE I	B SITE DAIL	Y AND RE NCE OF TH	MOVE FRO	OM THE PREMISES ANY DIRT	.Т.			
ORK TO BE F SED TO MIN NG WHICH J IPORARY P	ERFORMEE IIMIZE ANY ARE TO REN ARTITIONS /	D IN A CLEA INCONVEN MAIN IN OP AND/OR TA	N AND WO IIENCE OR ERATION. .RPS TO KE	ORKMANL DISTURBA ISOLATE (EEP DUST)	IKE MANNER, CARE SHALL B ANCE TO OTHER AREAS OF T CONSTRUCTION AREAS BY M AND DIRT WITHIN WORK AR	E HE EANS EA.			
ACTOR IS R F EACH WO OLS SHALL F	ESPONSIBLI RKING DAY. BE LEFT UN/	E TO PROPE ALL OPENI ATTENDED /	RLY SECU NGS TO B AT ANY TI	RE AREAS E CLOSED ME.	OF CONSTRUCTION AT THE WITH TAMPER-PROOF SCRE	WS.			
DINATE ALL	GRILLE, REG G PLAN.	SISTER AND	DIFFUSER	R LOCATIO	NS WITH ARCHITECT'S				YE
VPROOF BO	NGS THRU	SIDES OF A	LL INTAKE	E, EXHAUS ALL BE SEA	T AND RELIEF PLENUMS. ALED/CAULKED WATERTIGHT	r with			
OMERIC SEA	LANT. RE SEAL ALI	L DUCT AND) PIPE PEN	NETRATION	NS THRU GENERAL CONSTRU	ICTION			MEP/FF 603.444
ORDANCE V	VITH DIVISI	ON 7.	DMINIALS	SHALL BE		TEES			Project
TING HEIGH	ITS FOR THE	ERMOSTATS	S, EQUIPN	1ENT ON/0	DFF SWITCHES, ETC., LOCAT	ED IN			PLAN KEY:
CAP ACCESS WISE BY AR	SIBLE SPACE CHITECT. RI	ES SHALL BE EFER TO AR	48" TO TO CHITECTU	OP OF COI JRAL ELEV	NTROL UNLESS NOTED ATIONS FOR FURTHER DETA	LS.			
LE AIR DUCT TO TERMIN	S TO BE NO	OT OVER 6 F CTIONS.	EET LONG	G WITH AP	PROVED TRANSITIONS AND	SMOOTH			
DUCT CONN UCT SIZE TC	MATCH RU	O LOUVERS JNOUT SIZE	TO DRAIN UNLESS I	N TOWARI NOTED OT	D LOUVER. HERWISE.				
	S ARE TO IN	ISIDE OF LIN			ABLE.				
	M OF 10' A	COUSTICAL	DUCTWO		AFTER AND 5" BEFORE EAC	H AIR HANDLIN	G AND FAN COIL		
DE ACCESS F DINATE WIT DE MANUAL	ANELS/DO H DIVISION	ORS FOR AL 8. DAMPERS A	LL MECHA		MS REQUIRING ACCESS,				
DE FLEXIBLE WIRING		ONS BETWE	EEN MECH	IANICAL E	QUIPMENT AND DUCTWOR	ς,			
ATE HOT WA	TER HEATII	NG SUPPLY	AND RETU	JRN AND	GROUND SOURCE SUPPLY A	ND			PROJECT T
RM "PROVI	DE" SHALL I	MEAN "TO I	FURNISH,	INSTALL A	ND CONNECT COMPLETELY	I			RVCC
ORK IN INTE CESSARY CL	RIOR FINISH	HED SPACES	S EXCEPT \ PAINTING	WHERE IN AND/OR	DICATED IS TO BE CONCEALI REPLACEMENT OF FINISHES	ED ABOVE CEILIN AS REQUIRED. P	IG. PROVIDE ERFORM		RENO
R COORDIN	ATION WIT	H AFFECTED TE ACCESS D	D TRADES. DOOR LOC	CATIONS V	VITH ARCHITECT AND INTERI	OR DESIGNER.			1 COLLE
									CLAREM
FAN	SCF	IEDU	JLE						
		ELEC		DATA	MOTOR		DEMARKO		
PM ESF		VOLTS	PH	CY	STARTER	SUNES	REMARKS		
583 0.75	" 1/4	120	1	60	MANUAL SWITCH	7.6			
583 0.75	" 1/4	120	1	60	MANUAL SWITCH	7.6			
EGRAL OV	ERLOAD P	ROTECTIC	N, UNIT N		DISCONNECT SWITCH, IN		ISING,		
D MOTOR O ED AND IN	PERATED STALLED B	DAMPER W BY MECHAN	VITH END	SWITCH	AND REQUIRED MOTOR P. DR, WIRED BY ELECTRICAI	ACK. (MOTOR (_ CONTRACOTE	DPERATED R.)		SCALE: AS JOB #: 37
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	WARRENSTREET ARCHITECTS
	27 Warren Street Concord NH 03301 T 603 225 0640 E 603 225 0621 www.warrenstreet.coon
	OWNER MATT MOORE COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE 28 COLLEGE Dr CONCORD, NH 03301 P. (603) 344 5377 CONSTRUCTION MANAGER MILESTONE ENGINEERING + CONSTRUCTION, INC PO BOX 2279 1 HORSESHOE POND LANE CONCORD, NH 03302 - 2279 P. (603) 226 - 3877
	YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
	PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
	HUNDER NEW HAMBON STERNER GACION NO. 14957 SSIONAL ENGINE
	SCALE:AS NOTEDDWN BY: CSRJOB #:3773CHK BY: WRG
	PRINT DATE: 3/24/2023 1:15:05 PM ISSUE DATE: ISSUE DATE:
	3/24/2023 CONSTRUCTION DOCUMENTS
-	REVISION DATE COMMENTS
=	MECHANICAL GENERAL NOTES, LEGEND & ABBREVIATIONS
	SHEET NUMBER: 1 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW.

NO	
1	REMOVE EXISTING CEILIN
	CONDENSATE & POWER.
2	EXISTING THERMOSTAT
3	REMOVE EXISTING FIN-T
4	REMOVE EXISTING HWS8
	OR REWORK AS SHOWN
5	REMOVE EXISTING CEILIN
	RE-INSTALLATION. EXIST
6	REMOVE EXISTING DUCT
7	EXISTING DUCTWORK TO
8	REMOVE EXISTING ACV (

D

NEW WORK NOTES (M1.1) DESCRIPTION

RE-INSTALL EXISTING AIR TERMINAL INTO CEILING GRID. RECONNECT EXISTING FLEX TO BRANCH LINE AS/IF REQUIRED. BALANCE TO CFM RE-INSTALL EXISTING FAN COIL UNIT, CENTER IN GRID. PROVIDE NEW HANGING RODS & VIBRATION ISOLATORS. EXTEND EXTING REFRIGERANT PIPING AS/IF REQUIRED & RECONNECT. EXTEND EXISTING CONDENSATE AS/IF REQUIRED AND RECONNECT. EXTEND EXISTING REFRIGERANT PIPING AS/IF REQUIRED TO NEW FAN COIL UNIT LOCATION & RECONNECT. ATC TO INSTALL NEW WALL MOUNTED THERMOSTAT AND WIRE TO NEW ACV CONTROLLING RADIANT PANELS. PROVIDE WHITE WIRE MODLING AS/IF REQUIRED TO CONCEAL WIRING. CONNECT NEW 3/4" HWS TO EXISTING 3/4" HWS. CONNECT NEW 3/4" HWR TO EXISTING 3/4" HWR.

10"X10" E.A. UP THRU FLOOR ABOVE AND UP TO EF-2 ON ROOF. TRANSITION TO FAN CONNECTION SIZE IN FOOR CURB. EXISTING AUTOCLAVE RELOCATED TO THIS LOCATION BY C.M.. M.C. TO VENT AUTOCLAVE TO EXTERIOR PER MANUFACTURER'S

EXISTING LOW RETURN TO REMAIN AS IS. CLEAN AND PAINT GRILL TO MATCH WALL COLOR

DEMOLITION NOTES (M1.1) DESCRIPTION

ING CASSETTE UNIT COMPLETE & SET ASIDE FOR REINSTALLAITON. DISCONNECT REFRIGERANT PIPING,

TO REMAIN AS IS. UBE RADIATION COMPLETE, INCLUDING PIPING, WALL BRACKET AND COUNTER MOUNTED GRILLE. &R PIPING COMPLETE TO POINTS INDICATED, INCLUDING HANGERS, INSULATION, VALVES & ACCESSORIES. CAP

ON NEW WORK DRAWINGS. ING AIR TERMINAL COMPLETE & SET ASIDE FOR REINSTALLATION. CLEAN FACE OF GRILLE PRIOR TO

FING FLEX MAY BE RE-USED IF DETERMINED TO BE IN GOOD REPAIR. TWORK COMPLETE TO POINTS INDICATED, INCLUDING HANGERS, INSULATION AND ACCESSORIES.

D REMAIN AS IS. COMPLETE. ATC TO REMOVE LOW VOLTAGE WIRING. BACK TO FAN COIL.

	NEW WORK NOTES (M1.2
Number	DESCRIPTION
1	CONNECT NEW 10"Ø E.A. TO EXISTING 10"X8" E.A.
2	CONNECT NEW 10"Ø E.A. TO EXISTING 12"X6" E.A.
3	10"X10" E.A. UP TO EF-3 ON ROOF ABOVE. TRANSITION TO CONNECTION SIZE IN ROOF CURB.
4	CONNECT NEW 3/4" HWS&R TO EXISTING 3/4" HWS&R. PIPE TO RISE ABOVE CEILING EXPOSED O
5	PROVIDE NEW LIQUID & SUCTION PIPES FROM XBC-2 TO NEW FC-1.
6	HANG FC-1 FROM STRUCTURE WITH THREADED RODS & NEOPRENE TYPE VIBRATION ISOLATORS
7	M.C. TO MOUNT EA-1 TO DECK USING MOUNTING ARMS PROVIDED WITH EXTRACTOR. CONNEC

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SCALE: 1/4" = 1'-0"

С

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2)
ON WALL.
RS.
ECT NEW 4" EXHAUS TO EXTRACTOR.

Owner Owner </td
YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
SCALE: AS NOTED DWN BY: CSR JOB #: 3773 CHK BY: WRG
PRINT DATE: 3/24/2023 1:15:12 PM ISSUE DATE: 3/24/2023 CONSTRUCTION DOCUMENTS REVISION DATE COMMENTS
CHEMISTRY LAB #224 PART PLANS - DEMOLITION & NEW WORK
SHEET NUMBER: 3 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW.

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NTS

OUTSIDE SCREW & YOKE GATE VALVE

REDUCED PRESSURE ZONE ASSEMBLY

GENERAL NOTES

- 1. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EQUIPMENT AND PIPING INSTALLATION WITH ALL TRADES BEFORE COMMENCING WORK.
- THIS CONTRACT SHALL INCLUDE ALL THE NECESSARY PIPING, FITTINGS, TRANSITIONS ETC. AS NECESSARY TO INSTALL PLUMBING SYSTEM, AND TO AVOID ANY CONFLICTS WITH OTHER TRADES AND THE BUILDING STRUCTURE.
- IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW INDIVIDUAL BRANCH PIPING TO EACH PLUMBING FIXTURE; ONLY THE BRANCH PIPING TO GROUPS OF FIXTURES IS INDICATED. THE ENTIRE PLUMBING SYSTEM SHALL BE FULLY OPERATIONAL AND READY FOR BENEFICIAL USE BEFORE THE JOB IS CONSIDERED COMPLETE.
- DO NOT SCALE DRAWINGS. CONTRACTOR SHALL VERIFY ALL DIMENSIONS & CONDITIONS IN THE FIELD AND SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY & ALL DISCREPANCIES.
- 5. IT IS NOT INTENDED THAT THE DRAWINGS SHOW EVERY PIPE, FITTING, RISE/DROP OR DETAIL. SYSTEM & COMPONENTS SHALL BE INSTALLED ACCORDING TO THE INTENT AND MEANING OF CONTRACT DOCUMENTS AND IN ACCORDANCE WITH GOOD PRACTICE.
- CONTRACTOR IS RESPONSIBLE TO PROVIDE COMPLETE AND OPERATIONAL SYSTEMS WITH FACILITIES AND SERVICES TO MEET REQUIREMENTS INDICATED AND IN ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES.
- EQUIPMENT AND COMPONENTS HAVING EQUAL PERFORMANCE CHARACTERISTICS BY OTHER MANUFACTURERS MAY BE CONSIDERED, PROVIDED DEVIATIONS IN DIMENSIONS, OPERATION AND OTHER CHARACTERISTICS DO NOT CHANGE DESIGN CONCEPT OR INTENDED PERFORMANCE AS JUDGED BY THE ENGINEER. BURDEN OF PROOF OF EQUALITY OF PRODUCTS IS ON THE CONTRACTOR.
- CONTRACTOR IS RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOBSITE. OWNER ASSUMES NO RESPONSIBILITY FOR THE PROTECTION OF PROPERTIES AGAINST FIRE. THEFT AND ENVIRONMENTAL CONDITIONS.
- CONTRACTOR IS RESPONSIBLE TO PROPERLY PROTECT OWNER'S PROPERTY AND EQUIPMENT FROM INJURY, AND DAMAGE TO SAME SHALL BE REPLACED BY CONTRACTOR.
- 10. CONTRACTOR IS TO CLEAN JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
- 11. ALL WORK TO BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER, CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO SURROUNDING AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE CONSTRUCTION AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN WORK AREA
- 12. CONTRACTOR IS RESPONSIBLE TO PROPERLY SECURE AREAS OF CONSTRUCTION AT THE END OF EACH WORKING DAY.
- 13. EQUIPMENT AND PIPING TO BE INSTALLED IN ACCORDANCE WITH SEISMIC REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE.
- 14. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH ALL OTHER TRADES. 15. ALL EQUIPMENT SUPPORTS AND PIPE HANGERS TO BE CONNECTED FROM THE
- BUILDING STRUCTURE. 16. ALL PENETRATIONS THRU RATED WALLS, FLOORS AND CEILINGS SHALL BE FIRESTOPPED AND SEALED TO MAINTAIN RATING. REFER TO SPECIFICATION
- SECTION ON "FIRESTOPPING". 17. PROVIDE SHUT-OFF VALVES AT ALL BRANCH PIPING TAKE-OFFS.
- 18. INSULATE ALL PLUMBING SERVICES AS INDICATED IN THE SPECIFICATIONS.
- 19. NO PIPING SHALL BE INSTALLED WITHIN STAIRS, STAIR WALLS, ELEVATOR MACHINE ROOMS, TRANSFORMERS VAULTS, ELECTRICAL ROOMS OR OVER ELECTRICAL PANELS/EQUIPMENT. ONLY DEDICATED PLUMBING PIPING WILL BE ALLOWED WITHIN EACH OF THE SPACES INDICATED ABOVE. COORDINATE THE LOCATION OF ALL PIPING WITH ALL OTHER TRADES AND ADJUST AS NECESSARY.
- 20. PIPE ALL CONDENSATE DRAINS FROM MECHANICAL EQUIPMENT, BY GRAVITY TO FIXED AIR GAP FITTING. EACH CONDENSATE DRAIN SHALL BE TRAPPED AT THE EQUIPMENT DRAIN OUTLET. COORDINATE EXACT LOCATION WITH THE HVAC CONTRACTOR AND ADJUST AS NECESSARY.
- 21. COORDINATE THE EXACT LOCATION OF ALL UNDERGROUND EXISTING & NEW UTILITIES EXITING ENTERING THE BUILDING WITH THE SITE CONTRACTOR AND UTILITY DRAWINGS. COORDINATE ALL FOUNDATION WALL PENETRATIONS AND INVERT ELEVATIONS WITH THE GENERAL CONTRACTOR AND OR CONSTRUCTION MANAGER.
- 22. ALL INDIRECT WASTE DRAINS SHALL BE PIPED TO FLOOR DRAINS, FLOOR SINKS, FUNNELS OR A FIXED AIR GAP FITTING AND DISCHARGE THROUGH AN AIR GAP OR TO A SINK DRAIN TAILPIECE.
- 23. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELBOWS, TEES, DROPS AND MISCELLANEOUS PIPING DUE TO ELEVATION CHANGES, OBSTRUCTIONS AND COORDINATION WITH OTHER TRADES, ETC. TO INSTALL A COMPLETE AND FUNCTIONING PLUMBING SYSTEM.
- 24. CONTRACTOR SHALL PROVIDE ISOLATION VALVES ON ALL HOT, COLD AND RECIRCULATING HOT WATER BRANCHES IN ACCESSIBLE AREAS ONLY. PROVIDE ACCESS PANELS AS REQUIRED.
- 25. CONTRACTOR IS RESPONSIBLE TO CREATE AND MAINTAIN AS-BUILT DOCUMENTS FOR SUBMISSION AND APPROVAL.

WARRENSTREET ARCHITECTS 27 Warren Street Concord NH 03301 T 603.225.0640 F 603.225.0621 www.warrenstreet.coop
OWNER MATT MOORE COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE 28 COLLEGE Dr CONCORD, NH 03301 P. (603) 344 5377 CONSTRUCTION MANAGER MILESTONE ENGINEERING + CONSTRUCTION, INC PO BOX 2279 1 HORSESHOE POND LANE CONCORD, NH 03302 - 2279 P. (603) 226 - 3877
YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
WILLIAM GACHON NO. 14957 WILLIAM GACHON NO. 14957 CENSE CENSE SSIONAL ENGINITION
SCALE: AS NOTED DWN BY: SPW JOB #: 3773 CHK BY: WRG
PRINT DATE: 3/24/2023 1:15:14 PM
ISSUE DATE: 3/24/2023 CONSTRUCTION DOCUMENTS
REVISION DATE COMMENTS
PLUMBING GENERAL NOTES, LEGEND & ABBREVIATIONS
PODD SHEET NUMBER: 4 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRICHT I AW

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	YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
	PLAN KEY:
	PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
	WILLIAM GACHON NO. 14957 SS/ONAL ENGINE
	SCALE: AS NOTED DWN BY: SPW JOB #: 3773 CHK BY: WRG PRINT DATE: 3/24/2023 1:15:17 PM
	ISSUE DATE: 3/24/2023 CONSTRUCTION DOCUMENTS
	REVISION DATE COMMENTS
	LEARNING CENTER #123 PART PLANS DEMOLITION & NEW WORK
	P1 SHEET NUMBER: 5 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW.

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SCALE: 1/4" = 1'-0"

DEMOLITION NOTES (P1.4) DESCRIPTION

REMOVE EXIST SINK COMPLETE INCLUDING FAUCETS & FIXTURES. REMOVE EXIST HOT & COLD WATER AND GAS & COMPRESSED AIR PIPING TO POINT REMOVE EXIST FUME HOOD COMPLETE INCLUDING FAUCETS. RMOVE EXIST COLD WATER AND GAS PIPING COMPLETE.

REMOVE EXIST GAS PIPING FROM CEILING SPACE DOWN TO SHUT-OFF VAVLE.. REMOVE EXIST FLOOR DRAIN COMPLETE TO BELOW FLOOR. PATCH FLOOR TO MATCH EXISTING. CONTINUE DEMOLITION & NEW ORK ON FLOOR BELOW.

Variable Variable Variable Variable 27 Warren Street Concord NH 03301 1 603.225.0640 F 603.225.0621 www.warrenstreet.coop
OWNER MATT MOORE COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE 28 COLLEGE Dr CONCORD, NH 03301 P. (603) 344 5377 CONSTRUCTION MANAGER MILESTONE ENGINEERING + CONSTRUCTION, INC PO BOX 2279 1 HORSESHOE POND LANE CONCORD, NH 03302 - 2279 P. (603) 226 - 3877
YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
WILLIAM GACINON NO. 14957 WILLIAM GACINON NO. 14957 CENSES SS/ONAL ENGINE
SCALE: AS NOTED DWN BY: Author JOB #: 3773 CHK BY: Checker PRINT DATE: 3/24/2023 1:15:24 PM ISSUE DATE: 3/24/2023 CONSTRUCTION DOCUMENTS
REANS - DEIVIOLITION & NEVV WORK P144 SHEET NUMBER: 8 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW.

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CHEMISTRY LAB #203 - FIRE PROECTION OUTLINE SCALE: 1/4" = 1'-0"

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YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
SCALE: AS NOTED DWN BY: Author
PRINT DATE: 3/24/2023 1:15:03 PM ISSUE DATE: 3/24/2023
CONSTRUCTION DOCUMENTS REVISION DATE COMMENTS
LEVEL 2 PART PLANS - FIRE PROTECTION OUTLINES
FPP11 SHEET NUMBER: 9 OF 9 THE DRAWING AND ITS CONTENT IS THE INTELLECTUAL PROPERTY OF WARRENSTREET ARCHITECTS INC. WITH THE SOLE INTENT TO BUILD THE PROJECT TITLED ABOVE AT ONE LOCATION NOTED HEREIN. THE USE OF THE CONTENT FOR ANY OTHER PURPOSE IS PROHIBITED AND PROTECTED UNDER COPYRIGHT LAW.

Science ahs 107 155 003 &	one eight inch = one foot	one quarter inch = one foot	three quarter inch = one foot	one inch = one foot	one and one half inches = one foot	three inches = one foot
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ABBREV	IATION SCHEDULE
ABBREVIATION	DESCRIPTION
3R	NEMA 3R LISTED
AFF OR A.F.F.	ABOVE FINISHED FLOOR HEIGHT NOTED
AIC	AMPERES INTERRUPTING CAPACITY SYMMETRICAL
C/B OR CB	CIRCUIT BREAKER
CFD	CLAREMONT FIRE DEPRATMENT
CLNG OR CLG	CEILING
CU	COPPER
EC OR E.C.	ELECTRICAL CONTRACTOR
EPO	EMERGENCY POWER OFF
ETR	EXISTING TO REMAIN, UNLESS OTHERWISE NOTED
ERR	EXISTING TO REMAIN AND BE RELOCATED, UNLESS OTHERWISE NOTED OR SHOWN
EX.	EXISTING
FWU	FURNISHED AS PART OF UNIT
G.	EQUIPMENT GROUNDING CONDUCTOR
GF, G.F.C.I.	GROUND FAULT CIRCUIT INTERRUPTER
GF/CB	GROUND FAULT CIRCUIT BREAKER
HP	HORSEPOWER
KW	KILOWATTS
KVA	KILOVOLTS AMPERES
MFG	MANUFACTURER
NFPA	NATIONAL FIRE PREVENTION ASSOCIATION
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
N.T.S. OR NTS	NOT TO SCALE
PH	PHASE
REC.	RECEPTACLE
REF	REFRIGERATOR
U.L.	UNDERWRITERS LABORATORIES
UC REF	UNDERCOUNTER REFRIGERATOR
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VA	VOLT AMPERES
WP	WEATHERPROOF
VFD	VARIABLE FREQUENCY DRIVE

	LIGHTING CONTROL SYMBOLS	
SYMBOL	DESCRIPTION	MOUNTING
VS S	DIGITAL, CEILING MOUNTED, DUAL TECHNOLOGY, SMALL MOTION, 360 DEGREES OCCUPANCY SENSOR - NLIGHT #NCM-PDT-9-RJB	CEILING
	DIGITAL WALL MOUNTED DUAL TECHNOLOGY 120 DEGREE WIDE VIEW VACANCY SENSOR CONTRACTOR - NLIGHT #NCM-PDT-6-RJB -	CEILING CORNER
PPD N	DIGITAL RELAY POWER PACK - NLIGHT #NPP16-EFP FOR ON/OFF CONTROL - INSTALL ABOVE THE IEAREST ACCESSIBLE CEILING, UNLESS OTHERWISE NOTED ON THE DRAWINGS	ABOVE CEILING, UNO
\$d \$d \$d \$d \$d \$d \$d \$d \$d \$d	DIGITAL WALL SWITCH FOR SINGLE CHANNEL ON/OFF/RAISE/LOWER CONTROL - NLIGHT NPODM-DX-WHITE - a,b,c INDICATES SWITCH TO CONTROL THE `a',`b' & `c' DESIGNATED IGHT IXTURES - TYPICAL	WALL 44" AFF
a,b SD2 F F	DIGITAL WALL SWITCH FOR TWO CHANNEL ON/OFF/RAISE/LOWER CONTROL OF LIGHT 'IXTURES - ILIGHT #NPODM-2P-DX-WHITE - THE TOP BUTTON SHALL CONTROL THE `a' DESIGNATED LIGHT 'IXTURES AND THE BOTTOM BUTTON SHALL CONTROL THE `b' DESIGNATED LIGHT FIXTURES	WALL 44" AFF
a,b N c-d,e T SD4 S	DIGITAL WALL SWITCH FOR FOUR CHANNEL ON/OFF/RAISE/LOWER CONTROL OF LIGHT FIXTURES - ILIGHT #NPODM-4P-DX-WHITE - `all,a' INDICATES THE TOP TWO SETS OF OF BUTTONS #1 & #2 ARE 'O CONTROL `a' (#1) DESIGNATED LIGHTS AND `b' (#2) DESIGNATED LIGHTS. THE SECOND TWO SETS OF BUTTONS #3 & #4 ARE TO CONTROL `c' (#3) DESIGNATED LIGHT FIXTURES AND `d,e' (#4) DESIGNATED LIGHT FIXTURES IN THE ROOM WHERE THE SWITCHES ARE LOCATED.	WALL 44" AFF
	NOTES	1
LIGHTING FUNCTION ACCEPTAE INSTALL A CONTROL CARRY AL TECHNICI/ LIGHTING SYSTEMS	CONTROLS MANUFACTURED BY ACUITY AND SENSOR SWITCH HAVE BEEN SPECIFIED. EQUIPMENT JALITY MANUFACTURED BY GREENGATE, DOUGLAS, CRESTRON, PHILIPS AND WATTSTOPPER WILL BLE SUBSTITUTES. IND WIRE THE ABOVE EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. S DETAILS ON DRAWING E5.1. L COSTS TO PROVIDE EIGHT HOURS OF ON-SITE PROGRAMMING AND OWNER TRAINING BY A FAC AN FOR THE NEW LIGHTING CONTROLS. CONTROLS HAVE BEEN DESIGNED TO COMPLY WITH 2018 IECC SECTION C405 ELECTRICAL POWEF AND NEC.	T TYPES WITH EQUA BE CONSIDERED A SEE LIGHTING TORY AUTHORIZED R AND LIGHTING
	SPECIFIC CODE NOTES	
	FIRE PROTECTION REQUIREMENTS	

- A. PENETRATIONS IN WALLS REQUIRING PROTECTED OPENINGS MUST BE FIRESTOPPED WITH AN APPROVED MATERIAL.
- 1. CONDUITS MAY PENETRATE WALLS OR PARTITIONS, PROVIDED THEY ARE FIRE-STOPPED. 2. OPENINGS FOR STEEL ELECTRICAL BOXES NOT EXCEEDING 16 SQUARE INCHES
- ARE PERMITTED PROVIDED OPENINGS DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL OR PARTITION. 3. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.
- B. LIGHT FIXTURES AND OTHER APPARATUS SUPPORTED BY THE ACOUSTICAL CEILING GRID MUST MEET THE REQUIREMENTS OF NEC SECTION 410.16, MEANS OF SUPPORT.
- RECESSED LIGHTING FIXTURES INSTALLED IN FIRE RATED CEILING ASSEMBLIES SHALL BE FIRE RATED FIXTURES BEARING THE UL FIRE RATED LABEL. FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE UL FIRE RESISTANCE DIRECTORY, AND SHALL INCLUDE A FIRE RATED ENCLOSURE INSTALLED OVER THE FIXTURE THAT MEETS THE REQUIREMENTS OF THE UL FIRE RESISTANCE DIRECTORY.

TYPE	DESCRIPTION	MODEL	LUMENS	WATTAGE	VOLTAGE
A	2X2, VOLUMETRIC TYPE LED TROFFER WITH ACRYLIC LINEAR PRISMATIC DIFFUSER - CEILING RECESS MOUNT - ORIENT THE DIFFUSER LENS IN THE DIRECTION SHOWN ON THE ARCHITECTURAL DRAWINGS	LITHONIA #2VTL2-40L-ADP-EZ1-LP835	4026	33.1	277 MULTI VOLI
B12	12" LONG, UNDERCABINET LED LIGHT FIXTURE WITH ANTI-BICROBIAL WHITE FINISH AND DIMMABLE DOWN TO 10% - SURFACE MOUNT UNDERCABINET IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	HEALTHCARE LIGHTING #HUC512-MVOLT-LED35-LINKING OPTIONS AS REQUIRED FOR INTERCONNECTING LENGTHS OF UNDERCABINET LIGHTING AS SHOWN AND NOTED ON THE DRAWINGS-AM	328	7.06	277 MULTI VOLI
B19	19" LONG, UNDERCABINET LED LIGHT FIXTURE WITH ANTI-BICROBIAL WHITE FINISH AND DIMMABLE DOWN TO 10% - SURFACE MOUNT UNDERCABINET IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	HEALTHCARE LIGHTING #HUC519-MVOLT-LED35-LINKING OPTIONS AS REQUIRED FOR INTERCONNECTING LENGTHS OF UNDERCABINET LIGHTING AS SHOWN AND NOTED ON THE DRAWINGS-AM	1000	10	277 MULTI VOLI
B23	23" LONG, UNDERCABINET LED LIGHT FIXTURE WITH ANTI-BICROBIAL WHITE FINISH AND DIMMABLE DOWN TO 10% - SURFACE MOUNT UNDERCABINET IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	HEALTHCARE LIGHTING #HUC523-MVOLT-LED35-LINKING OPTIONS AS REQUIRED FOR INTERCONNECTING LENGTHS OF UNDERCABINET LIGHTING AS SHOWN AND NOTED ON THE DRAWINGS-AM	1221	12.25	277 MULTI VOLI
B35	35" LONG, UNDERCABINET LED LIGHT FIXTURE WITH ANTI-BICROBIAL WHITE FINISH AND DIMMABLE DOWN TO 10% - SURFACE MOUNT UNDERCABINET IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	HEALTHCARE LIGHTING #HUC535-MVOLT-LED35-LINKING OPTIONS AS REQUIRED FOR INTERCONNECTING LENGTHS OF UNDERCABINET LIGHTING AS SHOWN AND NOTED ON THE DRAWINGS-AM	1932	19.41	277 MULTI VOLI
B46	46" LONG, UNDERCABINET LED LIGHT FIXTURE WITH ANTI-BICROBIAL WHITE FINISH AND DIMMABLE DOWN TO 10% - SURFACE MOUNT UNDERCABINET IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	HEALTHCARE LIGHTING #HUC546-MVOLT-LED35-LINKING OPTIONS AS REQUIRED FOR INTERCONNECTING LENGTHS OF UNDERCABINET LIGHTING AS SHOWN AND NOTED ON THE DRAWINGS-AM	2065	26.3	277 MULTI VOLI
С	4" DIAMETER, LED DOWNLIGHT WHITE APERATURE/TRIM	LITHONIA #LDN4-35/10/L04-AWR MVOLT-GZ10	1045	10.58	277 MULTI VOLI
EM	EMERGENCY BATTERY UNIT WITH LITHIUM IRON PHOSPHATE BATTERY, TWO, AIMABLE, LED LIGHTING HEADS WITH 640 LUMEN OUTPUT EACH AND SELF DIAGNOSTICS REMOTE TESTING IN A WHITE THERMOPLASTIC, IMPACT-RESISTANT, SCRATCH-RESISTANT, CORROSION PROOF HOUSING - `CLG' INDICATES CEILING MOUNT	LITHONIA #ELM4L-UVOLT-LTP-SDRT	1280	3	277 UVOLT 120/277
X1	LED, EXIT SIGN WITH NICAD BATERY, WHITE THERMOPLASTIC HOUSING, RED LETTERING AND SELF-DIAGNOSTICS	EELP #XE2RW-EM-SD	-	3	277 UVOLT 120/277

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GENERAL ELECTRICAL NOTES

- DO NOT SCALE THESE DRAWINGS. SEE MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTINGS FOR FIXTURES, DEVICES, ETC. EXCEPT AS SPECIFICALLY NOTED.
- 2. REFER TO DIVISION 22 & 23 FOR ADDITIONAL PLUMBING & HVAC EQUIPMENT AND REQUIREMENTS.
- 3. PROVIDE BRANCH CIRCUITING AND FINAL CONNECTION FOR ALL MECHANICAL EQUIPMENT.
- 4. INSTALLATION SHALL COMPLY WITH 2020 EDITION OF NEC, 2018 EDITION OF IBC AND ALL STATE AND LOCAL CODES AND AMENDMENTS.
- MINIMUM CIRCUIT SIZE IS 1P-20A, 2 #12, 1 #12 GROUND MINIMUM CONDUIT SIZE IS 3/4", UNLESS OTHERWISE NOTED. TYPE `MC' CABLE MAY BE USED ONLY WHERE INSTALLED CONCEALED IN WALLS AND ABOVE ACCESSIBLE LAY-IN CEILINGS.
- ALL NEW WIRING SHALL BE TYPE THHN/THWN RATED 75-90°C, 600V. WET-DRY LOCATIONS. MINIMUM BRANCH CIRCUIT WIRING SHALL BE NO. 12 AWG SOLID COPPER. BRANCH CIRCUITS LONGER THAN 75 FEET FOR 120V SHALL BE AT LEAST NO. 10 AWG FROM PANEL TO LAST OUTLET.
- 7. PROVIDE SEPARATE GREEN GROUND WIRE (SIZE PER NEC) FOR ALL CIRCUITS INCLUDING LIGHTING.
- 8. HOMERUN CONDUITS SHALL CONTAIN SIX (6) UNGROUNDED PHASE CONDUCTORS MAXIMUM. VOLTAGE DROP AS PER N.E.C.
-). PROVIDE ROUGH-IN. FINAL CONNECTION, BRANCH CIRCUITS, PANELBOARDS, ETC, FOR ALL DEVICES AND EQUIPMENT SHOWN ON THESE DOCUMENTS.
- 10. CONTRACTOR SHALL VERIFY ROUGH-IN REQUIREMENTS FOR ALL MECHANICAL EQUIPMENT PRIOR TO BEGINNING ROUGH-IN. ANY DISCREPANCIES WITH THESE PLANS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.
- 1. THE MECHANICAL AND ELECTRICAL DRAWINGS INCLUDED IN THIS SET WERE ORIGINALLY PREPARED TO THE SCALE SHOWN ON THE TITLE BLOCK OF EACH SPECIFIC DRAWING. HOWEVER, BECAUSE OF THE INACCURACIES INHERENT TO THE ELECTRONIC PLOTTING AND/OR REPROGRAPHIC PROCESSES USED TO OBTAIN FINAL PRINTS, SPECIFIC DIMENSIONS SHOULD NOT BE OBTAINED BY SCALING OF THESE DRAWINGS. FIELD VERIFY ACTUAL DIMENSIONS.
- 12. PERMANENT TYPE MARKING PENS SHALL BE USED TO NEATLY LABEL ALL JUNCTION BOX AND PULL BOX COVERS. WHERE BOXES ARE INSTALLED FOR THE INSTALLATION OF POWER WIRING, THE COVER SHALL INDICATE THE PANEL DESIGNATION AND CIRCUIT BREAKER NUMBER(S) ASSOCIATED WITH EACH BOX. WHERE BOXES ARE INSTALLED FOR THE INSTALLATION OF TELECOMMUNICATION WIRING, THE COVERS SHALL BE LABELED `TELECOMMUNICATIONS' AND INDICATE THE POINT OF THE SYSTEM DISTRIBUTION LOCATION ASSOCIATED WITH EACH BOX.
- 13. ALL NEW WIRING SHALL BE INSTALLED CONCEALED IN NEW CONSTRUCTION AND IN EXISTING SHEET ROCKED WALLS. THE ELECTRICAL CONTRACTOR SHALL FISH THE REQUIRED WIRING IN EXISTING LOCATIONS WHERE POSSIBLE IN ORDER TO PREVENT THE CUTTING AND PATCHING OF THE FINISHED WALLS AND CEILINGS. ANY WIRING THAT CANNOT BE CONCEALED IN FINISHED AREAS SHALL BE RUN IN SURFACE MOUNTED WIREMOLD RACEWAY. COORDINATE ROUTING OF ALL SURFACE MOUNTED RACEWAYS WITH THE ARCHITECT PRIOR TO INSTALLATION. ALL SURFACE MOUNTED RACEWAYS INSTALLED PRIOR REVIEW AND PPROVAL FROM THE ARCHITECT SHALL BE REMOVED AND REINSTALLED TO THE ARCHITECT'S AND OWNER'S SATISFACTION AT NO ADDITIONAL COSTS TO THE OWNER. PROVIDE SURFACE MOUNTED WIREMOLD RACEWAY IN THE COLOR DIRECTED BY THE ARCHITECT.
- 14. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND PROVIDE AS REQUIRED FOR ALL THE FIRE DAMPERS AND MOTORIZED DAMPERS, AS SHOWN ON THE DOCUMENTS UNDER DIVISION 23.
- 15. PROVIDE ENGRAVED NAMEPLATES FOR ALL PANELBOARDS, DISCONNECT SWITCHES, MANUAL MOTOR STARTERS, SERVICE SWITCHES, AUTOMATIC TRANSFER SWITCHES ETC. NAMEPLATES SHALL BE SCREWED-ON OR RIVETED TO THE EQUIPMENT. ADHESIVE TYPES WILL NOT BE ACCEPTABLE. NAMEPLATES SHALL BE LAMINATED BLACK WITH WHITE ENGRAVED TEXT. TEXT HEIGHT SHALL BE 1/4".
- 16. THE DIRECTORIES IN THE EXISTING PANELBOARDS HAVING NEW WORK PERFORMED IN THEM SHALL BE REPLACED WITH NEW TYPEWRITTEN CIRCUIT DIRECTORIES THAT REFLECT THE NEW AND EXISTING CIRCUITS CONNECTED TO THOSE PANELBOARDS.
- 17. NO EXISTING ELECTRICAL EQUIPMENT, SYSTEMS, OR APPURTENANCES SHALL BE ABANDONED IN PLACE, EXCEPT THAT CONDUIT LOCATED IN EXISTING REMAINING WALLS AND FLOOR SLABS MAY BE ABANDONED IN PLACE.
- 18. ALL PANELBOARDS SHALL BE FURNISHED WITH TYPEWRITTEN CIRCUIT DIRECTORIES AT CLOSE OF PROJECT. ALL SPARE CIRCUIT BREAKERS SHALL BE IDENTIFIED ON THE CIRCUIT DIRECTORIES AS `SPARES' AND SHALL BE LOCKED IN THE OFF POSITION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROPERLY PHASE BALANCING LOADS ON EACH PANELBOARD.
- 19. DISCONNECT SWITCHES SHALL BE HEAVY DUTY (HD), SIDE OPERATED WITH INTERLOCKING COVER.
- 20. THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY ALL CHARGES FOR PERMITS AND INSPECTIONS. 21. EXISTING SERVICES OUTSIDE THE SCOPE OF THIS PROJECT SHALL BE MAINTAINED IN TACT. ANY REQUIRED OUTAGES SHALL BE FULLY COORDINATED WITH THE CONSTRUCTION MANAGER AT LEAST 72 HOURS IN
- 22. COORDINATE WITH THE CONSTRUCTION MANAGER AND ALL OTHER SUB-CONTRACTORS IN ORDER TO DETERMINE THE OVERALL PROJECT PHASING AND WORK SEQUENCING.

ADVANCE.

- 23. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFY NAMEPLATE LOADS OF ALL EQUIPMENT (MECHANICAL AND OWNER SUPPLIED) TO ENSURE PROPER WIRE SIZING AND OVERCURRENT PROTECTION AND SHALL NOTIFY ENGINEER OF DISCREPANCIES.
- 24. SEAL ALL ELECTRICAL PENETRATIONS THRU FIRE RATED PARTITIONS WITH FIRE RATED MATERIAL EQUAL TO DOW CORNING SILICONE RTV FOAM AS A MINIMUM. MATERIAL SELECTION SHALL BE BASED ON RATING OF PARTITION PENETRATED.
- 25. PROVIDE ALL FIRE ALARM WORK IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL CODES AND IN COMPLIANCE WITH THE FIRE ALARM RULES AND REGULATIONS OF THE LOCAL FIRE DEPARTMENT.
- 26. THE COVERS ON ALL PULL BOXES, JUNCTION BOXES AND ASSOCIATED COVERS FOR THE INSTALLATION OF THE FIRE ALARM SYSTEM SHALL BE PAINTED RED AND SHALL BE NEATLY LABELED IN ACCORDANCE WITH THE LOCAL FIRE DEPARTMENT'S REQUIREMENTS.
- 27. NEW FIRE ALARM SYSTEM DEVICES AND WIRING SHALL BE COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. PROVIDE ALL EQUIPMENT NEEDED FOR A COMPLETE AND OPERATIONAL EXPANDED EXISTING FIRE ALARM SYSTEM AS SHOWN AND NOTED ON THE DRAWINGS.
- 28. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE EXISTING FIRE ALARM SYSTEM REMAINS IN OPERATION THROUGHOUT ALL PHASES CONSTRUCTION.
- 29. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR A COMPLETE AND OPERATIONAL EXISTING FIRE ALARM SYSTEM AFTER THE INSTALLATION OF ALL NEW FIRE ALARM SYSTEM EQUIPMENT TO THE SATISFACTION OF THE OWNER AND LOCAL FIRE DEPARTMENT.
- 30. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR RETESTING THE ENTIRE FIRE ALARM SYSTEM UPON COMPLETION OF THIS PROJECT TO THE SATISFACTION OF THE OWNER AND THE LOCAL AHJ. ALL COSTS ASSOCIATED WITH TESTING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- 31. ALL 20 AMP, 125 VOLT RECEPTACLES SHALL BE TAMPER-RESISTANT TYPES.
- 32. ALL SWITCHES, RECEPTACLES, TELECOMMUNICATION OUTLETS AND COVERPLATES SHALL BE PROVIDED IN THE COLOR WHITE. ALL PLATES SHALL BE HIGH ABUSE NYLON TYPES WHEN AVAILABLE.
- 33. THE MOUNTING HEIGHTS NOTED IN THE ELECTRICAL SYMBOL LEGEND ARE TO THE CENTER OF THE DEVICES, UNLESS OTHERWISE NOTED OR SHWON ON THE DRAWINGS.
- 34. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID . NO ALLOWANCES WILL BE MADE FOR ADDITIONAL COSTS DUE TO THE CONTRACTOR'S FAILURE TO FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS. 35. WHEN RACEWAYS PASS FROM HEATED (INDOORS) TO UNHEATED (OUTDOORS) SPACES THE RACEWAYS
- SHALL BE RIGID AND SHALL BE FILLED WITH AN APPROVED MATERIAL TO PREVENT THE CIRCULATION OF WARM AIR TO A COLDER SECTION OF RACEWAY.

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BRAND NAMES

WHERE A BRAND NAME IS USED, IT IS USED FOR INFORMATIONAL PURPOSES AND IS INTENDED TO DESCRIBE A STANDARD OF QUALITY

ELECTRICAL SYMBOL NOTES

ALL SYMBOLS ARE NOT NECESSARILY USED. ALL MOUNTING HEIGHTS SHOWN IN SYMBOL LEGEND SHALL BE AS PER ADA REQUIREMENTS UNLESS OTHERWISE NOTED ON THE DRAWINGS.

ABBREVIATIONS & ELECTRICAL SYMBOL LEGEND DESCRIPTION MOUNTING IG SINGLE RECEPTACLE WALL 0V, 2 POLE, 3 WIRE, GROUNDING, TAMPER RESISTANT DUPLEX RECEPTACLE NEMA 5-20R - `AC' TES ABOVE COUNTER - `H' INDICATES INSTALL HORIZONTALLY - `CLNG' INDICATES CEILING WALL 18" AFF ED. SEE STUDENT LAB STATION SYMBOLS ON DRAWING E1.2 FOR INFORMATION REGARDING THE UNO TACLES SHOWN IN THE LAB STATIONS DV, 2 POLE, 3 WIRE, GFCI, GROUNDING, TAMPER RESISTANT DUPLEX RECEPTACLE NEMA 5-20R - `AC' WALL 18" AFF TES ABOVE COUNTER - SEE STUDENT LAB STATION SYMBOL LEGEND ON DRAWING E1.2 FOR UNO IATION REGARDING THE RECEPTACLES SHOWN IN THE LAB STATIONS 0A, 120V, 2 POLE, 3 WIRE, GROUNDING, TAMPER RESISTANT DUPLEX RECEPTACLE NEMA 5-20R - `AC' WALL 18" AFF TES ABOVE COUNTER UNO RECEPTACLE SHALL CONSIST OF ONE, 20A, 120V, 2 POLE, 3 WIRE, GFCI, FEED-THRU, GROUNDING, RESISTANT DUPLEX RECEPTACLE NEMA 5-20R AND ONE, 20A, 120V, 2 POLE, 3 WIRE, NON-GFCI, DING, TAMPER RESISTANT DUPLEX RECEPTACLE NEMA 5-20R - `AC' INDICATES ABOVE COUNTER -WALL 18" AFF HE NON-GFCI RECEPTACLE FROM THE FEED-THU GFCI RECEPTACLE TO PROVIDE GFCI PROTECTION UNO E NON-GFCI RECEPTACLE - SEE STUDENT LAB STATION SYMBOL LEGEND ON DRAWING E1.2 FOR ATION REGARDING THE RECEPTACLES SHOWN IN THE LAB STATIONS IG LAB STATION/COUNTER PEDESTAL TYPE DUPLEX RECEPTACLES COUNTER IG LAB TABLE MOUNTED QUAD RECEPTACLE LAB TABLE FLOOR TO IG POWER AND TELECOMMUNICATIONS POLE CEILING ON BOX - SIZE IN ACCORDANCE WITH NEC VARIES IG JUNCTION BOX IN CONCRETE FLOOR BOX FLOOR ATED, POKE-THRU FLUSH FLOOR BOX - SEE STUDENT LAB STATION SYMBOL LEGEND ON DRAWING FLOOR R INFORMATION REGARDING THE RECEPTACLES SHOWN IN THE LAB STATIONS IG TV OUTLET WALL IG EMERGENCY POWER OFF PUSH BUTTON WALL SS ACCESS POINT CEILING MMUNICATIONS OUTLET WALL IOUNTED TELEPHONE OUTLET WALL , 120 VOLT, MOTOR RATED, THREE-WAY TOGGLE SWITCH SUITABLE FOR UP TO A MINIMUM OF 1/2 44" AFF UNO POWFR IG SURFACE MOUNTED 6"X4' LIGHT FIXTURE - `S' INDICATES SURFACE MOUNTED CEILING LING RECESSED MOUNTED LIGHT FIXTURE CEILING G MOUNTED, SINGLE FACE EXIT SIGN CEILING 44" AFF G MOUNTED, EMERGENCY BATTERY UNIT WITH TWO, EMERGENCY LIGHTING HEADS UNO IG WALL MOUNTED SPEAKER WALL IG WALL MOUNTED CLOCK - BATTERY OR SYSTEM CONNECTED TYPE TO BE DETERMINED IN THE WALL IG SECURITY SYSTEM MOTION SENSOR WALL POLE MOTOR RATED SWITCH WITH THERMAL OVERLOAD PROTECTION - 'M2' INDICATES PROVIDE DLE, MOTOR RATED SWITCH WITH THERMAL OVERLOAD PROTECTION - PROVIDE THERMAL UNIT FOR MOTOR LOAD ACTUALLY SERVED, VERIFY WITH EQUIPMENT MANUFACTURER. `FWU' INDICATES HED AS PART OF UNIT DUTY, NEMA 1, NON-FUSED (NF) DISCONNECT SWITCH - `30' INDICATES MAXIMUM AMPERAGE OF THE WALL INECT - `3R' INDICATES NEMA 3R DISCONNECT SWITCH - `FWU' INDICATES FURNISHED WITH UNIT DUTY, NEMA 1, FUSED DISCONNECT SWITCH - SUBSCRIPT INDICATES AMPS/FUSE SIZE - `TD' TES PROVIDE TIME DELAY FUSES - `3R' INDICATES PROVIDE NEMA 3R DISCONNECT SWITCH ATION VARIABLE FREQUENCY DRIVE/DISCONNECT SWITCH - FURNISHED BY ANOTHER TRADE, LED AND WIRED BY THE ELECTRICAL CONTRACTOR VOLT PANELBOARD, SWITCHBOARD OR LOAD CENTER - 'P4' INDICATES PANELBOARD NAME -WALL IENT CONNECTION VARIES UN TO PANELBOARD AND CIRCUIT NUMBERS INDICATED ON THE DRAWINGS, UNLESS OTHERWISE -----NOT ALL PANELBOARD DESIGNATIONS HAVE CIRCUIT NUMBERS INDICATED IG FIRE ALARM CONTROL PANEL WALL IOUNTED, FIRE ALARM SYSTEM CONNECTED STROBE LIGHT WALL G MOUNTED, FIRE ALARM SYSTEM CONNECTED STROBE LIGHT CEILING MOUNTED, FIRE ALARM SYSTEM CONNECTED HORN/STROBE LIGHT CEILING IG CEILING MOUNTED FAN COIL UNIT CEILING TON KEYNOTE SYMBOL - `1' INDICATES SEE DEMOLITION KEYNOTE #1 TYPICAL TE SYMBOL - `1' INDICATES SEE KEYNOTE #1 - TYPICAL ST FAN - 'EF-1' INDICATES EXHAUST FAN TYPE 1 - SEE MECHANICAL DRAWINGS. ROOF COPERATED DAMPER - FURNISHED BY ANOTHER TRADE, INSTALLED AND WIRED BY THE E.C.

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DISCONNECT AND REMOVE THE EXISTING LIGHT FIXTURES AND ALL ASSOCIATED LIGHT SWITCHES LOCATED IN THIS R REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLETE, EXCEPT THAT THE EXISTING FEED TO THESE LIGHT FIXTU SHALL BE MAINTAINED FOR RECONNECTION TO THE NEW LIGHT FIXTURES BEING INSTALLED IN THIS ROOM. SEE DRAW FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
DISCONNECT AND REMOVE THE EXISTING LIGHT FIXTURES AND ALL ASSOCIATED LIGHT SWITCHES LOCATED IN THIS R REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLETE.
EXISTING WALL MOUNTED SECURITY SYSTEM MOTION SENSOR TO BE MAINTAINED AND SHALL BE PROTECTED BY THE CONSTRUCTION MANAGER TO ENSURE THAT NO DAMAGE OCCURS TO THIS DEVICE DURING THE DEMOLITION AND
RENØVATION OF THIS ROOM. EXISTING CEILING MOUNTED HORN/STROBE LIGHT TO BE REMOVED AND RELOCATED AS REQUIRED FOR REMOVAL OF CEILING BY ANOTHER TRADE. BAG THIS DEVICE AND TEMPORARILY SUPPORT FROM THE STRUCTURE. MAINTAIN ALL ASSOCIATED CONDUIT AND WIRING FOR REINSTALLATION OF THIS DEVICE ON THE NEW CEILING. SEE DRAWING E1.2 F
ADDITIONAL INFORMATION AND REQUIREMENTS. EXISTING WALL MOUNTED STRØBE LIGHT TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLET EXISTING VGA CABLE RUN EXPOSED AT THIS APPROXIMATE LOCATION SHALL BE REMOVED COMPLETE AND RETURNED
OWINER EXISTING BATTERY OPERATED CLOCK TO BE REMOVED, BE SAFELY STORED AND BE REINSTALLED BY THE CONSTRUCT
MANAGER. EXISTING DISCONNECT SWITCH FEEDING THE AUTOCLAVE GETTING RELOCATED BY THE OWNER. THE ELECTRICAL CONTRACTOR SHALL REMOVE AND REINSTALL THIS DISCONNECT SWITCH TO THE LOCATION SHOWN ON DRAWING E1. MAINTAIN THE EXISTING FEED TO THE AUTOCLAVE AND EXTEND AS REQUIRED FOR CONNECTION OF THIS DISCONNEC
SWITCH IN ITS NEW LOCATION. SEE DRAWINGS E1.2 FOR ADDITIONAL INFORMATION AND CONNECTION REQUIREMENTS ALL EXISTING RECEPTACLES & TELECOMMUNICATION WALL OUTLETS LOCATED ON WALLS AND CEILINGS, INCLUDING PLUGMOLD LOCATED IN THIS ROOM SHALL BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLETE EXISTING FLUSH BACK BOXES AND CONCEALED CONDUITS MAY BE REUSED TO FEED NEW DEVICES. SEE DRAWING E1
NEW DEVICE LOCATIONS AND CONNECTIONS.
EXISTING TELEPHONE TO BE REMOVED BY THE CONSTRUCTION MANAGER, SAFELY STORED AND REINSTALLED BY THE CONSTRUCTION MANAGER. THE EXISTING WALL MOUNTED TELEPHONE OUTLET SHALL REMAIN AS IS, UNLESS OTHERV NOTED OR SHOWN ON THE DRAWINGS.
EXISTING TELECOMMUNICATIONS OUTLET AND ALL ASSOCIATED CONDUIT AND WIRING SHALL REMAIN AS IS, UNLESS OTHERWISE NOTED OR SHOWN ON THE DRAWINGS
ÉXISTING CEILING MOUNTED FAN COIL UNIT TO BE REMOVED FROM THE CEILING BY ANOTHER TRADE AND SHALL BE PROTECTED AND TEMPORARILY SUPPORTED BY ANOTHER TRADE THE ELECTRICAL CONTRACTOR MAY NEED TO DISC THIS UNIT IF IT IS DETERMINED THAT THE UNIT NEEDS TO BE TEMPORARILY REMOVED FROM THIS ROOM FOR THE RENOVATIONS. IN WHICH CASE THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ALL ASSOCIATED CONDUIT AND WIRIN MAKE SAFE, UNTIL THIS UNIT GETS REINSTALLED ON THE NEW CEILING BY ANOTHER TRADE. ONCE REINSTALLED ON T CEILING THE ELECTRICAL CONTRACTOR SHALL RECONNECT TO THE EXISTING WIRING AND SHALL EXTEND ALL EXISTIN CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THIS UNIT.
EXISTING JUNCTION BOX AND ALL ASSOCIATED CONDUIT AND WIRING TO BE REMOVED COMPLETE. DESKTOP/COUNTER TOP PEDESTAL TYPE RECEPTACLE AND ALL ASSOCIATED CONDUIT AND WIRING TO BE REMOVED COMPLETE.
DISCONNECT ALL ELECTRICAL CONNECTIONS TO THE EXISTING FUME HOOD AS REQUIRED FOR REMOVAL BY ANOTHER THIS SHALL INCLUDE ALL CONNECTIONS AND CONTROLS TO THE EXHABIT FAN ASSOCIATED WITH THIS FUME HOOD. F ALL ASSOCIATED CONDUIT AND WIRNG COMPLETE.
THERE IS A PIECE OF EQUIPMENT LOCATED ON THIS WALL IN THIS APPROXIMATE LOCATION. THE ELECTRICAL CONTRA SHALL VERIFY REQUIREMENTS WITH THE OWNER AND PERFORM THE WORK ASSOCIATED WITH THIS PIECE OF EQUIPM DIRECTED BY THE OWNER.
DISCONNECT AND COMPLETELY REMOVE THE EXISTING EXPOSED CABLE RUNNING DOWN THE WALL IN THIS APPROXIN LOCATION.
THERE ARE TWO PIECES OF WALL MOUNTED EQUIPMENT LOCATED ABOUT THREE QUARTERS OF THE WAY UP THE WAY THIS APPROXIMATE LOCATION. THE ELECTRICAL CONTRACTOR SHALL VERIFY REQUIREMENTS WITH THE OWNER AND PREFORM THE WORK ASSOCIATED WITH THESE TWO PIECES OF EQUIPMENT AS DIRECTED BY THE OWNER.
DIŚCÓNNECT AND COMPLETELY REMOVE THE CARD READER AND REMOVE ALL ASSOCIATED CONDUIT AND WIRING CO INCLUDING ALL CONNECTIONS TO ANY ASSOCIATED ELECTRIC DOOR STRIKES AND ANY ELECTRIC DOOR STRIKE ASSO EQUIPMENT.
ALL EXISTING ELECTRICAL EQUIPMENT LOCATED ON WALLS NOT BEING DEMOLISHED IN THE RENOVATIONS SHALL REN IS, UNLESS OTHERWISE NOTED OR SHOWN ON THIS DRAWING.
REMOVE AND REINSTALL ALL EXISTING DEVICES LOCATED ON THIS WALL AND REINSTALL ON THE NEW WALL, UNLESS THE EXISTING DEVICES ARE LOCATED IN THE AREA OF THIS EXISTING WALL THAT WILL GET A DOOR OPENING CUT INTO THEN THOSE DEVICES AND ALL ASSOCIATED CONDUIT AND WIRING SHALL BE COMLETELY REMOVED. SEE DRAWING E THE NEW WALL LOCATION. MAINTAIN ALL EXISTING CONDUIT AND WIRING FOR RECONNECTION TO THOSE DEVICES IN THEIR NEW LOCATIONS. SEE DRAWING E1.2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
DISCONNECT AND REMOVE THE EXISTING RECEPTACLE AND REMOVE ALL ASSOCIATED CONDULT AND WIRING COMPLE
REMOVE AND RELOCATE THE EXISTING WALL MOUNTED TELEPHONE JACK. MAINTAIN ALL ASSOCIATED CONDUIT AND WIRING COMPLET FOR RECONNECTION OF THIS DEVICE IN ITS NEW LOCATION. SEE DRAWING E1.2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
LAB TOP MOUNTED QUAD RECEPTACLE TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLETE
EXISTING SURFACE MOUNTED RACEWAY WITH WIRING TO BE COMPLETELY REMOVED.
REMOVE THE EXISTING CERING MOUNTED STROBE LIGHT. REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLET
EXISTING CEILING MOUNTED STROBE LIGHT TO BE REMOVED AND RELOCATED. MAINTAIN ALL ASSOCIATED CONDUIT A WIRING FOR RECONNECTION OF THIS DEVICE IN ITS NEW LOCATION. SEE DRAWING E1.2 FOR ADDITIONAL INFORMATIO REQUIREMENTS
EXISTING CEILING MOUNTED HORN/STROBE LIGHT TO BE REMOVED AND RELOCATED AS REQUIRED FOR REMOVAL OF CEILING BY ANOTHER TRADE. BAG THIS DEVICE AND TEMPORARILY SUPPORT FROM THE STRUCTURE. MAINTAIN ALL ASSOCIATED CONDUIT AND WIRING FOR REINSTALLATION OF THIS DEVICE ON THE NEW CEILING. SEE DRAWING E1.2 F ADDITIONAL INFORMATION AND REQUIREMENTS
EXISTING WIRELESS ACCESS POINT DEVICE TO BE REMOVED BY THE OWNER PRIOR TO START OF DEMOLITION. THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING DATA CONNECTION AT THE CEILING AS REQUIRED FOR REM THE CEILING BY ANOTHER TRADE. MAINTAIN ALL ASSOCIATED CONDUIT, WIRING AND JACKS FOR REINSTALLATION ON CEILING. SEE DRAWING E1 2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
EXISTING POWER POLE TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND WIRING COMPLETE.
EXISTING START/STOP STATION AND HANDS/OFF/AUTO SWITCH FOR CONTROL OF THE EXISTING FUME HOOD EXHAUS BE REMOVED AND RELOCATED. MAINTAIN ALL ASSOCIATED CONDUIT AND WIRING FOR RECONNECTION OF THESE DEV THEIR NEW LOCATIONS, SEE DRAWING ET 2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
TWO, EXISTING JUNCTION BOXES LOCATED ON THIS WALL SHALL BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT A WIRING COMPLETE.
DISCONNECT ALL THE EXISTING CONNECTIONS TO THE EXISTING FUME HOOD AND TO THE EXISTING FUME HOOD EXH AS REQUIRED FOR REMOVAL AND RELOCATION OF THE EXISTING FUME HOOD EXHAUST SYSTEM BY ANOTHER TRADE MAINTAIN ALL ASSOCIATED CONDUIT AND WIRING AS REQUIRED FOR RECONNECTION TO THE FUME HOOD AND ASSOCIATED CONDUCTION AND ASSOCIATED FOR RECONNECTION TO THE FUME HOOD AND ASSOCIATED FOR RECONNECTION TO THE FUME HOOD AND ASSOCIATED CONDUCTION AND ASSOCIATED FOR RECONNECTION TO THE FUME HOOD AND ASSOCIATED FOR RECONNECTION
LATAUST FAIN IN ITS NEW LOCATION, SEE DRAWING ETZ FUR ADDITIONAL INFURMATION AND REQUIREMENTS.
EXISTING EMERGENCY POWER OFF SWITCH TO BE REMOVED AND RELOCATED. MAINTAIN ALL ASSOCIATED CONDULT A WIRING AS REQUIRED FOR RECONNECTION OF THIS DEVICE IN ITS NEW LOCATION. SEE DRAWING E1.2 FOR ADDITIONA INFORMATION AND REQUIREMENTS.

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THE NEW WALL, UNLESS ANY OF DOOR OPENING CUT INTO IT, EMOVED. SEE DRAWING E1.2 FOR ON TO THOSE DEVICES IN THE

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ASSOCIATED CONDUIT AND WALL IS GETTING A NEW WALL WILL BE INSTALLED ON THIS WALL

DEMOLITION SHEET NOTES

1. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PHASES OF DEMOLITION AND CONSTRUCTION. COORDINATE WITH GENERAL CONSTRUCTION.

2. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES AND LIGHTING FIXTURES IN DEMOLITION AREAS UNLESS NOTED OTHERWISE.

3. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES IN WALLS TO BE DEMOLISHED. WALLS TO BE DEMOLISHED ARE SHOWN DASHED. DISCONNECT AND REMOVE ASSOCIATED CONDUIT AND WIRE BACK TO LAST REMAINING DEVICE. FURNISH AND INSTALL CONDUIT AND WIRE AS NECESSARY FOR CONTINUITY OF CIRCUIT(S) TO ANY EXISTING DEVICE(S) TO REMAIN. COORDINATE AND VERIFY REQUIREMENTS WITH NEW WORK IN AREA.

4. FURNISH AND INSTALL CONDUIT AND WIRE AS NECESSARY FOR CONTINUITY OF ANY FEEDERS OR BRANCH CIRCUITS ORIGINATING OUTSIDE THE DEMOLITION AREA THAT SERVES ANY ELECTRICAL EQUIPMENT OR DEVICES TO REMAIN AFTER DEMOLITION. MODIFY OR REPLACE AS REQUIRED.

5. FURNISH AND INSTALL CONDUIT AND/OR COMMUNICATIONS/ DATA WIRING AS NECESSARY FOR CONTINUITY OF ANY WIRING ORIGINATING OUTSIDE THE DEMOLITION AREA THAT SERVES ANY COMMUNICATIONS/DATA EQUIPMENT OR DEVICES TO REMAIN AFTER DEMOLITION. MODIFY OR REPLACE AS REQUIRED.

6. DISCONNECT AND REMOVE LIGHT SWITCHES IN DEMOLITION AREAS AS NECESSARY TO ACCOMMODATE NEW DOOR CONFIGURATIONS.

- 7. DISCONNECT AND REMOVE ANY EXISTING ELECTRICAL DEVICES AND BACK BOXES AS NECESSARY WHERE NEW WALL CONSTRUCTION WILL INTERSECT AN EXISTING WALL. FURNISH AND INSTALL CONDUIT AND WIRE AS REQUIRED FOR CONTINUITY OF CIRCUIT(S).
- 8. FURNISH AND INSTALL BLANK COVER PLATES OVER ALL EXISTING UNUSED OPENINGS.
- 9. LOCATIONS SHOWN FOR EXISTING EQUIPMENT ARE APPROXIMATE.
- 10. ELECTRICAL DEMOLITION SHALL CONSIST OF MAKE-SAFE DISCONNECTION OF EXISTING ELECTRICAL POWER LIGHTING AND SYSTEMS WIRING FOR COORDINATED REMOVAL OF WIRING AND EQUIPMENT BY DEMOLITION CONTRACTORS. DISCONNECTION AND REMOVAL SHALL CONICIDE WITH THE ARCHITECTURAL DEMOLITION OF WALLS, CEILINGS AND ASSOCIATED RENOVATIONS.
- 11. ELECTRICAL DEMOLITION SHALL BE LIMITED TO EQUIPMENT AND WIRING IN WALLS, CEILINGS AND FLOORS SCHEDULED FOR REMOVAL, UNLESS OTHERWISE NOTED OR SHOWN ON THE DRAWINGS. CARE SHALL BE TAKEN TO KEEP ACTIVE ANY AND ALL ADJACENT POWER, LIGHTING AND SYSTEMS WIRING INTACT WHERE FOUND DEEMED TIED OR CIRCUITED TOGETHER. MAINTAIN OPERATIONAL INTEGRITY OF WIRING FOR THOSE SYSTEMS WHICH WILL REMAIN ACTIVE DURING DEMOLITION AND NEW CONSTRUCTION.
- 12. ALL WIRING AND CONDUIT REMAINING AFTER DEMOLITION IS COMPLETED AND THAT IS IMPROPERLY SUPPORTED SHALL BE PROPERLY SECURED AND SUPPORTED FROM THE STRUCTURE BY THE ELECRICAL CONTRACTOR.
- 13. PROVIDE DEPROGRAMMING OF ANY EXISTING ADDRESSABLE FIRE ALARM DEVICES BEING REMOVED OR BEING REMOVED AND RELOCATED. PROVIDE REPROGRAMMING OF TEMPORARY CONFIGURED DEVICES AND WIRING AS REQUIRED TO MAINTAIN A SAFE AND MONITORED WORK SITE.
- 14. THE OWNER SHALL BE GIVEN AMPLE OPPORTUNITY TO IDENTIFY ANY EXISTING DEVICES OR EQUIPMENT WHICH SHALL BE RETAINED. ALL EQUIPMENT DETERMINED TO BE UNWANTED SHALL BE PROPERLY DISPOSED OF BY THE ELECTRICAL CONTRACTOR.
- 15. PRESERVE THE INTEGRITY OF WIRING AND CIRCUITS OF ALL EXISTING AND REMAINING ELECTRICAL EQUIPMENT.
- 16. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE DEMOLITION REQUIREMENTS WITH THE GENERAL CONTRACTOR AND PROVIDE 72 HOUR NOTIFICATION OF A TEMPORARY POWER OR SYSTEMS DISTRUPTIONS ASSOCIATED WITH THE MAKE SAFE WIRING REMOVALS.
- 17. SEE THE ELECTRICAL DEMOLITION KEYNOTES FOR ADDITIONAL DEMOLITON REQUIREMENTS AND INFORMATION ASSOCIATED WITH SPECIFIC ELECTRICAL EQUIPMENT OR SYSTEMS TO BE REMOVED, TO REMAIN AND/OR BE RELOCATED.
- 18. ALL EXISTING CONDUITS CONCEALED IN WALLS, IN SHEET-ROCKED CEIILNGS, IN FLOOR SLABS AND BELOW GRADE SHALL BE ABANDONED IN PLACE AND MAY BE REUSED PROVIDED THE MATERIALS MEET THE REQUIREMENTS OF THESE DOCUMENTS. CONDUITS IN CONCRETE OR RUN THROUGH FLOORS SHALL BE CUT FLUSH WITH THE FLOOR AND COVERED, UNLESS OTHERWISE NOTED.
- 19. WHERE THE ELECTRICAL CONTRACTOR MAY HAVE A QUESTION REGARDING WHETHER OR NOT EXISTING ELECTRICAL EQUIPMENT IS TO REMAIN, BE RELOCATED, BE REWIRED, BE REFED OR BE REMOVED COMPLETE, HE SHALL BE REQUIRED TO OBTAIN VERIFICATION FROM THE ARCHITECT PRIOR TO ANY COMMENCEMENT OF WORK.
- 20. THE ELECTRICAL CONTRACTOR SHALL BECOM FAMILIAR WITH ALL PLANS BEFORE VISITING THE SITE, INCLUDING THE ARCHITECT'S DEMOLITION DRAWINGS AND REFLECTED CEILING PLANS.
- 21. ALL CABLING CONNECTED TO EXISTING TELECOMMUNICATION OUTLETS BEING REMOVED FROM THE AREAS BEING RENOVATED MUST BE COMPLETELY REMOVED BACK TO THE EXISTING TELECOMMUNICATIONS SYSTEM EQUIPMENT LOCATED IN SERVER ROOM #122B, UNLESS OTHERWISE NOTED OR SHOWN ON THE DRAWINGS.
- 22. ALL EXISTING ELECTRICAL EQUIPMENT LOCATED ON WALLS BEING DEMOLISHED FOR THE RENOVATIONS SHALL BE REMOVED COMPLETE, UNLESS OTHERWISE NOTED ON THE DRAWINGS AS EXISTING TO REMAIN OR EXISTING REMOVED AND RELOCATED. ALL ASSOCIATED CONDUITS AND WIRING SHALL BE REMOVED COMPLETE.
- 23. ALL KEYNOTES ON THIS DRAWING ARE NOT UTILIZED AS PART OF THE SCOPE OF THIS PROJECT.

CHEMISTRY LAB #224 - LIGHTING

SCALE: 1/8" = 1'-0"

LIGHTING GENERAL NOTES

- 1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON THIS DRAWING.
- 2. ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILINGS SHALL BE INSTALLED WITH 6' LONG FLEXIBLE METAL CONDUIT.
- 3. ALL MOUNTING HEIGHTS FOR LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURES UNLESS INDICATED OTHERWISE.
- 4. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUITING AND SWITCHING SHOWN.
- 5. CIRCUIT NUMBERS SHOWN AT DEVICES CORRESPOND TO PANELBOARD BREAKERS. BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE DRAWINGS
- USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 75 FEET, AND #8 FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 150 FEET AND #10 AWG FOR 20 AMPERE, 277 VOLT CIRCUITS LONGER THAN 150 FEET, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- 7. PROVIDE UNSWITCHED FEED TO EMERGENCY BATTERY UNITS WITH LIGHTING HEADS AND EXIT SIGNS.
- 8. ALL LIGHT FIXTURE LOCATIONS SHALL BE COORDINATED WITH HVAC DUCTWORK AND OTHER EQUIPMENT IN THE FIELD TO AVOID INTERFERENCE PRIOR TO ROUGHING IN.
- 9. COORDINATE ALL LIGHTING FIXTURE LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATION PLANS. CONFIRM SWITCHING SCHEME AND SWITCH LOCATIONS WITH THE ARCHITECT/OWNER PRIOR TO ROUGHING IN.
- 10. OCCUPANCY SENSORS SHALL BE LOCATED A MINIMUM OF SIX FEET FROM MECHANICAL AIR FLOW VENTS.
- 11. PROVIDE ALL CLASS 2, 0-10 VOLT DIMMING WIRING FROM DIGITAL DIMMING RELAY POWER PACKS AND LIGHT FIXTURE DRIVERS. SEE LIGHTING CONTROL DETAILS ON DRAWING E5.1.
- 12. PROVIDE ALL PRE-CONNECTED CAT5E CABLES ASSOCIATED WITH THE FROM DIGITAL RELAY POWER PACKS (DIMMING AND NON-DIMMING), WALL SWITCHES AND VACANCY SENSORS. SEE SPECIFICATIONS SECTION 260923 LIGHTING CONTROL DEVICES. SEE LIGHTING CONTROL DETAILS ON DRAWINGS E5.1.
- 13. SEE DRAWING E5.1 FOR THE LIGHTING CONTROL NARRATIVE AND PROGRAMMING SEQUENCE NOTES.
- 14. INSTALL CONDUITS WITH NO MORE THAN TWO 90 DEGREE BENDS BETWEEN PULL BOXES AND NO MORE THAN 100'-0" BETWEEN PULL BOXES. PULL BOXES SHALL BE INSTALLED FOR STRAIGHT PULLS ONLY.
- 15. THE TYPE 'B' SERIES UNDERCABINET LIGHT FIXTURES ARE TO BE FED FROM THE BACK OF THE FIXTURE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE ELECTRICAL CONTRACTOR SHALL POSITION LIGHT FIXTURE UNDER CABINET AS REQUIRED FOR INSTALLATION OF THE JUNCTION BOX BEHIND THE LIGHT FIXTURE. LIGHT FIXTURE INSTALLATION REQUIREMENTS WILL DEPEND ON THE ACTUAL LIGHT FIXTURE BEING INSTALLED AT THIS PROJECT.

LIGHTING KEYNOTES

- 1. FEED FROM THE EXISTING LIGHTING CIRCUIT THAT HAD FED THE LIGHT FIXTURES REMOVED FROM THIS ROOM. SEE DEMOLITION KEYNOTES ON DRAWING ED1.1.
- 2. THIS LIGHT FIXTURE HAS BEEN PROVIDED FOR SERVICING EXISTING PANELBOARD P3 AND SHALL BE CONTROLLED MANUALLY ON AND OFF USING A SINGLE POLE TOGGLE SWITCH. PROVIDE A RED ENGRAVED NAMEPLATE WITH WHITE TEXT THAT READS 'FOR CONTROL OF SERVICE LIGHT LOCATED ABOVE PANEL P3. THIS SWITCH MUST BE USED WHEN SERVICING PANEL P3'. SCREW A NAMEPLATE ON THE WALL DIRECTLY ABOVE PANEL P3.
- 3. PROVIDE PLUG-IN LINKING EXTENSION CONNECTOR FROM THE LIGHT FIXTURE MANUFACTURER IN APPROPRIATE LENGTH FOR INTERCONNECTION OF UNDER CABINET LIGHTS. INSTALL AND SUPPORT THE LINKING CONNECTOR IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND NEC. EACH UNDER CABINET LIGHT FIXTURE SHALL BE INSTALLED CENTERED UNDER EACH SECTION OF WALL CABINET.
- 4. WALL MOUNT ABOVE COUNTER.
- 5. SEE LIGHTING CONTROL DETAILS ON DRAWING E5.1 FOR ADDITIONAL INFORMATION & WIRING REQUIREMENTS.

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1.	EXISTING BATTERY OPERATED CLOCK TO BE REINSTALLED BY THE CONSTRUCTION MANAGER TO THE LOCATION DIRECTED BY THE ARCHITECT. THE LOCATION SHOWN ON THIS DRAWING IS APPROXIMATELY WHERE THE CLOCK EXIS BEFORE RENOVATIONS TO THIS ROOM WERE STARTED.
2.	NEW STUDENT LAB STATION. SEE THE TYPICAL STUDENT LAB STATION CONNECTION DETAIL ON THIS DRAWING FOR ADDITIONAL EQUIPMENT AND CONNECTION REQUIREMENTS. THE CONSTRUCTION MANAGER SHALL BE RESPONSIBLE .SAW CUTTING THE EXISTING FLOOR FOR THE INSTALLATION OF THE FLOOR BOX AND ASSOCIATED CONDUITS. SEE TH NOTES IN THE SUDENT LAB STATION SYMBOLS ON THIS DRAWING FOR ADDITIONAL INFORMATION AND REQUIREMENT
3.	NEW STUDENT LAB STATION. SEE THE TYPICAL STUDENT LAB STATION CONNECTION DETAIL ON THIS DRAWING FOR ADDITIONAL EQUIPMENT AND CONNECTION REQUIREMENTS. THE CONSTRUCTION MANAGER SHALL BE RESPONSIBLE CORE DRILLING THE EXISTING FLOOR. SEE THE NOTES IN THE SUDENT LAB STATION SYMBOLS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
4.	EXISTING CEILING MOUNTED HORN/STROBE LIGHT NOTED TO BE REMOVED AND RELOCATED AS REQUIRED FOR INSTALLATION OF A NEW CEILING BY ANOTHER TRADE SHALL BE REINSTALLED ONTO THE NEW CEILING. REWORK AND EXTEND ALL EXISTING CONDUIT AND WIRING OR INSTALL NEW AS MAY BE REQUIRED FOR RECONNECTION OF THIS DE ON THE NEW CEILING IN THE LOCATION SHOWN ON THIS DRAWING. THE ELECTRICAL CONTRACTOR SHALL SET THE CANDELA SETTING ON THIS DEVICE TO THE CANDELA SETTING SHOWN ON THIS DRAWING. SEE DRAWING ED1.1.
5.	INTERCONNECT TO THE NEAREST NOTIFICATION SIGNALING CIRCUIT WITH CAPACITY FOR CONNECTION OF THIS NEW DEVICE. THE ELECTRICAL CONTRACTOR SHALL VERIFY THAT THERE IS ADEQUATE CAPACITY ON THAT NOTIFICATION SIGNALING CIRCUIT FOR THE ADDITION OF HIS DEVICE. IF IS DETERMINED THAT THE NEAREST AVAILABLE EXISTING NOTIFICATION SIGNALING CIRCUIT DOES NOT HAVE ADEQUATE CAPACITY FOR THE ADDITION OF THIS DEVICE, THEN T ELECTRICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND CONNECTIONS NEEDED FOR THE OPERATION OF TH NEW DEVICE FROM THE EXISTING FIRE ALARM CONTROL PANEL. ALL WIRING SHALL MATCH EXISTING AND SHALL BE INSTALLED IN CONDUIT.
6.	EXTEND THE EXISTING CONDUIT AND WIRING THAT HAD FED THE DISCONNECT SWITCH THAT WAS NOTED TO BE REMOVED AND RELOCATED IN THE ELECTRICAL DEMOLITION NOTES ON DRAWING ED1.1. THAT DISCONNECT SWITCH SERVED THE AUTOCLAVE UNIT THAT IS GETTING RELOCATED BY THE OWNER. ALL WIRING SHALL BE RUN IN CONDUIT
7.	CONNECT TO THE AUTOCLAVE USING LIQUID-TITE FLEXIBLE METAL CONDUIT. CONDUCTOR SIZE AND TYPE SHALL MAT THE EXISTING CONDUCTORS GETTING EXTENDED AND CONNECTED TO THE RELOCATED AUTOCLAVE DISCONNECT SWITCH.
8.	FOR GOGGLE SANITIZER. INSTALL HORIZONTALLY BELOW THE GOGGLE SANITIZER AT 32" AFF.
9.	PROVIDE A SINGLE GANG, 2-1/8" DEEP, SURFACE MOUNTED BACK BOX, BLANK PLATE AND A 1-1/2" CONDUIT TO ABOVE ACCESSIBLE CLASSROOM CEILING FOR THE OWNER TO USE TO INSTALL A PLATE WITH REQUIRED FITTING AT THE BA' BOX WITH CABLING WITH THE APPROPRIATE FITTING TO THE CEILING MOUNTED PROJECTOR. INSTALL THE BLACK BOX LOCATION DIRECTED BY THE ARCHITECT.
10.	FOR CEILING MOUNTED PROJECTOR. FIELD VERIFY ACTUAL RECEPTACLE LOCATION WITH THE ARCHITECT PRIOR TO ROUGHING IN. RECEPTACLE SHALL BE INSTALLED IN THE FACE OF THE CEILING OR PROJECTOR MOUNTING PANEL. FIL COORDINATE ACTUAL REQUIREMENTS WITH THE CONSTRUCTION MANAGER.
11.	EXISTING CEILING MOUNTED FAN COIL UNIT BEING REINSTALLED ON THE NEW CEILING BY ANOTHER TRADE. REWORK EXTEND EXISTING CONDUIT AND WIRING OR INSTALL NEW CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THE EXISTING XFCU ON THE NEW CEILING. SEE ELECTRICAL DEMOLITION NOTES ON DRAWING ED
12.	FUME HOOD SYSTEM IS BEING FURNISHED WITH A 10 FOOT CORD AND PLUG AND SHALL PLUG INTO THIS RECEPTACK. THE RECEPTACKE SHALL BE MOUNTED HIGH ON THE WALL. FIELD COORDINATE THE MOUNTING HEIGHT AND ACTUAL LOCATION WITH THE FUME HOOD SYSTEM INSTALLER PRIOR TO ROUGHING IN.
13	CONNECT TO THE ROOF TOP MOUNTED FUME HOOD EXHAUST FAN FOR THE NEW FUME HOOD. SEE MECHANICAL DRAWINGS FOR THE ACTUAL LOCATION OF THE EXHAUST FAN.
14.	NEW LOCATION FOR THE EXISTING EMERGENCY POWER OFF DEVICE NOTED TO BE REMOVED AND RELOCATED. SEE DRAWING ED1.1. REINSTALL THIS DEVICE AT 44" AFF. REWORK AND EXTEND THE EXISTING CONDUIT AND WIRING OR INSTALL NEW CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THIS DEVICE IN ITS NEW LOCATION
15.	NEW LOCATION FOR THE EXISTING START/STOP STATION AND HANDS/OFF/AUTO SWITCH FOR CONTROL OF THE FUME HOOD EXHAUST FAN IN THE FUME HOOD NOTED TO BE REMOVED AND RELOCATED. SEE DRAWING ED1.1. REINSTALL THESE DEVICES SO THAT THE OPERATING PORTIONS OF THESE DEVICES ARE NO HIGHER THAN 48" AFF. REWORK AN EXTEND THE EXISTING CONDUIT AND WIRING OR INSTALL NEW CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THESE DEVICES IN THEIR NEW LOCATIONS.
16.	NEW LOCATION FOR THE EXISTING FUME HOOD BEING REINSTALLED AT THIS LOCATION BY ANOTHER TRADE. SEE DRAWING ED1.1. REWORK AND EXTEND ALL EXISTING CONDUIT AND WIRING AS REQUIRED FOR RECONNECTION AND OPERATION OF THE FUME HOOD IN ITS NEW LOCATION AND THE ASSOCIATED FUME HOOD EXHAUST FAN.
17.	NEW LOCATION FOR THE EXISTING FIRE ALARM STROBE LIGHT NOTED TO BE REMOVED AND RELOCATED. SEE DRAWN ED1.1. REWORK AND EXTEND EXISTING CONDUIT AND WIRING OR INSTALL NEW CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THIS DEVICE IN ITS NEW LOCATION. THE ELECTRICAL CONTRACTOR SHALL FIELD ADJUST THE CANDELA SETTING ON THIS DEVICE TO THE CANDELA SETTING SHOWN ON THIS DRAWING.
18.	REINSTALL THE EXISTING PLATE JACK ONTO THE NEW CEILING AND AS REQUIRED FOR CONNECTION OF THE EXISTING WIRELESS ACCESS POINT DEVICE (WAP) BEING REINSTALLED BY THE OWNER. REWORK AND EXTEND EXISTING COND AND WIRING OR INSTALL NEW AS MAY BE REQUIRED TO PROVIDE A DATA CONNECTION TO THE 'WAP'. SEE DRAWING ED1.1.
19.	LABEL SWITCH PLATE TO INDICATE THE LOAD SERVED.
20.	REINSTALL ALL EXISTING ELECTRICAL DEVICES AND EQUIPMENT THAT HAD BEEN ON THE EXISTING WALL BETWEEN R #203 AND #220 BEING REMOVED AS PART OF THE RENOVATIONS. THE EXISTING DEVICES AND EQUIPMENT SHALL BE REINSTALLED ON THIS NEW WALL IN THE APPROXIMATE LOCATIONS WHERE THEY HAD EXISTED ON THE REMOVED W. REWORK AND EXTEND ALL EXISTING CONDUITS AND WIRING OR INSTALL NEW CONDUIT AND WIRING AS MAY BE REQUIRED FOR RECONNECTION OF THE EXISTING DEVICES AND EQUIPMENT IN THEIR NEW LOCATIONS.
21.	ALL EXISTING ELECTRICAL EQUIPMENT LOCATED ON THIS WALL SHALL REMAIN AS IS, UNLESS OTHERWISE NOTED OR SHOWN ON THE DRAWINGS. SEE DRAWING ED1.1.
22.	NEW LOCATION FOR THE EXISTING TELEPHONE OUTLET NOTED TO BE REMOVED AND RELOCATED. SEE DRAWINGS E REWORK AND EXTEND ALL EXISTING CONDUIT AND WIRING OR INSTALL NEW AS MAY BE REQUIRED FOR RECONNECT AND OPERATION OF THIS DEVICE IN ITS NEW LOCATION.
23.	THE ELECTRICAL CONTRACTOR SHALL INSTALL AND WIRE THE MOTOR RATED DAMPER (MOD), END SWITCH AND MOT PACK ASSOCIATED WITH THE ROOF TOP MOUNTED EXHAUST FAN. 120 VOLT CONTROL WIRING SHALL ALSO BE PROVI FROM THE LINE VOLTAGE END SWITCH TO START THE EXHAUST FAN WHEN THE DAMPER HAS REACHED THE FULLY O POSITION. THE END SWITCH HAS NOT BEEN SHOWN ON THE DRAWINGS. FIELD COORDINATE THE MOD EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS WITH THE MECHANICAL CONTRACTOR AND INSTALL AND WIRE THE MO AND ALL ASSOCIATED EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
24.	CONNECT TO THE AUTOCLAVE USING LIQUID-TITE FLEXIBLE METAL CONDUIT. CONDUCTOR SIZE AND TYPE SHALL MAT CONDUCTORS CONENCTED AT THE DISCONNECT SWITCH.
25.	LOCATED ON ROOF. SEE MECHANICAL DRAWINGS FOR ACTUAL LOCATION.
20. 27.	SEE ORAWING E1.3 FOR BRANCH CIRCUIT CONNECTION REQUIREMENTS, UNLESS OTHERWISE NOTED OR SHOWN ON
28.	URAWING FEED FROM AN EXISTING 20 AMP, 1 POLE, SPARE CIRCUIT BREAKER IN EXISTING PANELBOARD P1A, CIRCUIT BREAKER WILL BECOME AVAILABLE IN PANELBOARD P1A AFTER DEMON DION IS COMPLETED
[<u>2</u> 9.	PROVIDE SIX, NEW 20 AMP, 1 POLE CIRCUIT BREAKERS IN THE FLUSH WALL MOUNTED, GENERAL ELECTRIC LOAD CEN P3. USE THE EXISTING, 20 AMP, 1 POLE SPARE CIRCUIT BREAKERS AND THE NEW 20 AMP, 1 POLE CIRCUIT BREAKERS FEED THE NEW CIRCUITS SHOWN ON THIS DRAWING. EXISTING CIRCUIT BREAKERS WILL BECOME AVAILABLE AFTER DEMOLITION HAS BEEN COMPLETED. THE AIC RATING OF THE NEW CIRCUIT BREAKERS SHALL MATCH THE AIC RATING THE CIRCUIT BREAKERS IN THIS LOAD CENTER. A NEW CIRCUIT BREAKER DIRECTORY IS REQUIRED TO BE PROVIDED THIS EXISTING LOAD CENTER. ALL EXISTING BRANCH CIRCUITS REMAINING SHALL BE TRACED FOR PROPER IDENTIFICATION ON THE NEW CIRCUIT BREAKER DIRECTORY.
30.	PROVIDE NEW 15 AMP, 2 POLE CIRCUIT BREAKER IN THE EXISTING FLUSH MOUNTED, SQUARE D QO TYPE PANELBOAF P2D TO FEED THE NEW FC-1 UNIT. THE AIC RATING OF THIS NEW CIRCUIT BREAKER SHALL MATCH THE AIC RATING OF EXISTING CIRCUIT BREAKERS IN THIS PANELBOARD. THE ELECTRICAL CONTRACTOR SHALL REMOVE THE 2, 20 AMP, 1 SPARE CIRCUIT BREAKERS AT POSITIONS #30 AND #32 IN THIS PANELBOARD AND REPLACE WITH THE NEW 15 AMP, 2 FCIRCUIT BREAKER. TURN THE REMOVED CIRCUIT BREAKERS OVER TO THE OWNER. COVERS WERE NOT TAKEN OFF T PANELBOARD TO CONFIRM THAT THE 20 AMP, 1 POLE SPARE CIRCUIT BREAKERS AT POSTIONS #30 AND #32 LABELED SPARES ON THE PANELBOARD DIRECTORY HAVE NOTHING CONNECTED TO THEM. IF IT IS DETERMINED IN THE FIELD THESE TWO CIRCUIT BREAKERS ARE BEING USED, THEN ANY OTHER SPARES IN THIS PANELBOARD SHALL BE UTILIZE REQUIRED FOR INSTALLATION OF THE NEW 15 AMP, 2 POLE CIRCUIT BREAKER. THE ELECTRICAL CONTRACTOR MAY N TO MOVE BRANCH CIRCUIT CONNECTIONS AROUND IN THIS PANELBOARD IN ORDER TO OBTAIN A TWO POLE SPACE T INSTALL THE 15 AMP, 2 POLE CIRCUIT BREAKER. SEE DRAWING E14 FOR THE LOCATION OF EXISTING PANELBOARD POLE

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POWER GENERAL NOTES

- 1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON THE DRAWINGS, EXCEPT ITEMS LISTED ON SHEET E0.01 GENERAL ELECTRICAL NOTES.
- 2. MAXIMUM NUMBER OF 4 INFORMATION OUTLET LOCATIONS PER CONDUIT HOME RUN TO MDF OR IDF IS PERMITTED. CONDUIT SHALL BE SIZED AS FOLLOWS:
 - 1 INFORMATION OUTLET LOCATION: 1" 2 INFORMATION OUTLET LOCATIONS: 1 1/4" 3 INFORMATION OUTLET LOCATIONS: 1 1/2"
- 3. INSTALL CONDUIT WITH NO MORE THAN (2) 90° BENDS BETWEEN PULL BOXES, AND NO MORE THAN 100'-0" BETWEEN PULL BOXES. PULL BOXES SHALL BE INSTALLED FOR STRAIGHT THRU PULLS ONLY.
- 4. ALL COMMUNICATIONS CABLES SHALL BE INSTALLED IN CONDUIT. CABLE TRAY. OR SUPPORTED BY CABLE HOOKS. PROVIDE BUSHINGS AT THE ENDS OF ALL CONDUIT WHERE STUBBED ABOVE ACCESSIBLE CEILINGS OR WHERE DROPPED INTO CABLE TRAY. PROVIDE CABLE HOOKS ABOVE ACCESSIBLE CEILINGS FOR CABLE INSTALLATION WHERE NOT INSTALLED IN CONDUIT OR CABLE TRAY.
- 5. ALL COMMUNICATIONS CABLES SHALL BE INSTALLED IN CONDUIT OR CABLE TRAY
- 6. LOCATIONS SHOWN FOR EXISTING EQUIPMENT ARE APPROXIMATE.
- 7. THE AIC RATING FOR ALL NEW CIRCUIT BREAKERS BEING INSTALLED IN EXISTING PANELBOARDS SHALL MATCH THE AIC RATING OF THE EXISTING CIRCUIT BREAKERS LOCATED IN THE EXISTING PANELBOARDS.
- 8. PROVIDE NEATLY TYPED UPDATED PANELBOARD DIRECTORIES IN ALL EXISTING PANELBOARDS BEING WORKED IN FOR THESE RENOVATIONS. THE DIRECTORIES SHALL INDICATE THE EXISTING REMAINING LOADS AND ALL NEW LOADS ADDED AS A RESULT OF THE RENOVATIONS. ALL SPARE CIRCUIT BREAKERS SHALL BE TURNED TO AND LOCKED IN THE `OFF' POSITION AND IDENTIFIED ON THE DIRECTORIES AS `SPARE'.
- 9. USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 75 FEET, AND #8 FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 150 FEET AND #10 AWG FOR 20 AMPERE, 277 VOLT CIRCUITS LONGER THAN 150 FEET, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- 10. COORDINATE LOCATION OF ALL ELECTRICAL DEVICES WITH THE ARCHITECTURAL ELEVATIONS AND DETAILS, WHICH TAKE PRECEDENCE OVER THE LOCATIONS SHOWN ON THE ELECTRICAL DRAWINGS.
- 11. RECEPTACLES SHALL BE INSTALLED FLUSH IN THE NEW AND EXISTING SHEETROCKED WALLS AND SHALL BE SURFACE MOUNTED ON THE EXISTING CMU WALLS USING SURFACE MOUNTED WIREMOLD RACEWAY, BOXES AND ASSOCIATED FITTINGS IN THE COLOR DIRECTED BY THE ARCHITECT. SEE ARCHITECTURAL DRAWINGS FOR WALL TYPES.
- 12. PROVIDE BOX EXTENDERS AS MAY BE REQUIRED AT LOCATIONS WHERE THE EXISTING WALL SURFACES ARE GETTING TILE APPLIED AND EXISTING BACK BOX LOCATIONS ARE BEING REUSED FOR INSTALLATION OF NEW DEVICES OR EXISTING DEVICES ARE NOTED AS EXISTING TO REMAIN. SEE THE ARCHITECTURAL DRAWINGS FOR WALL FINISHES.
- 13. ALL NEW 20 AMP, 120 VOLT DUPLEX, QUAD AND GFCI RECEPTACLES SHALL BE PROVIDED AS TAMPER RESISTANT TYPES IN THE COLOR WHITE WITH WHITE HIGH ABUSE NYLON COVERPLATES.
- 14. ALL KEYNOTES ON THIS DRAWING ARE NOT UTILIZED AS PART OF THE SCOPE OF THIS PROJECT.

STUDENT LAB STATION SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING
	GFCI, DUPLEX RECEPTACLE WITH PLATE FURNISHED ON THE SIDE OF THE STUDENT LAB STATION	SIDE OF LAB STATION
₽ FWUT PU	NON-GFCI DUPLEX, POP-UP RECEPTACLE FURNISHED ON THE TOP OF THE STATIONARY PART OF THE STUDENT LAB STATION	TOP OF LAB STATION
⊐∯ FWUS	NON-GFCI QUAD RECEPTACLE FURNISHED ON THE SIDE OF THE STATIONARY PART OF THE STUDENT LAB STATION - CONNECT AS REQUIRED TO PROVIDE FEED-THRU GFCI PROTECTION FROM THE GFCI RECEPTACLE SHOWN ON THE DRAWINGS FEEDING THIS RECEPTACLE	SIDE OF LAB STATION
LSC	FACTORY PRE-WIRED LAB STATION CONTROLS FOR RAISING AND LOWERING THE TOP OF THE STUDENT LAB STATION	SIDE OF LAB STATION
FB	SINGLE GANG, FULLY ADJUSTABLE, FLUSH-IN CONCRETE FLOOR BOX FOR CONNECTION OF STUDENT LAB STATION RECEPTACLES AND CONTROLS LOCATED IN THE STUDENT LAB STATIONS ON THE FIRST FLOOR - EQUAL TO WIREMOLD SINGLE GANG CAST IRON FLOOR BOX COMPLETE WITH CARPET & TILE FLANGE IN THE FINISH DIRECTED BY THE ARCHITECT AND POWER/COMMUNICATION COVER PLATE WITH 3/4" PLUG FOR CONNECTION OF 3/4" LIQUID TITE FLEXIBLE METAL CONDUIT WITH POWER CONDUCTORS FOR CONNECTION OF THE STUDENT LAB STATION RECEPTACLES AND CONTROLS	Flush-in Floor
FB PT	FLUSH WITH FLOOR FIRE-RATED FURNITURE FEED POKE-THRU DEVICE FOR CONNECTION OF STUDENT LAB STATION RECEPTACLES AND CONTROLS LOCATED IN THE STUDENT LAB STATIONS ON THE SECOND FLOOR - EQUAL TO WIREMOLD #4FFATC15-LJB IN FINISH DIRECTED BY THE ARCHITECT AND WITH CARPET & TILE COVER FLANGE WITH A MINIMUM OF ONE, 3/4" TRADE SCREW PLUG OPENING FOR CONNECTION OF THE 3/4" LIQUID-TITE FLEXIBLE METAL CONDUIT WITH POWER CONDUCTORS FOR CONNECTION OF THE STUDENT LAB STATION RECEPTACLES AND CONTROLS	THRU-FLOOR
	HOMERUN TO PANELBOARD INDICATED ON THE DRAWINGS	

NOTES

ALL RECEPTACLE AND CONTROL LOCATIONS SHOWN ON THE DRAWINGS ON THE STUDENT LAB STATION CONNECTION DETAIL HAVE BEEN ASSUMED. NO DRAWINGS WERE PROVIDED SHOWING THE ACTUAL RECEPTACLE AND CONTROL LOCATIONS REQUIRED FOR THE STUDENT LAB STATIONS BEING PROVIDED FOR INSTALLATION AT THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LAB STATION VENDOR THE EXACT EQUIPMENT MANUFACTURER INSTALLATION AND CONNECTION REQUIREMENTS FOR THE STUDENT LAB STATIONS PRIOR TO ROUGHING IN.

THE ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE THE EXACT INSTALLATION LOCATION FOR THE FLUSH-IN CONCRETE FLOOR BOXES AND FIRE-RATED POKE-THRU DEVICES WITH THE ARCHITECT PRIOR TO ROUGHING IN.

ALL FLUSH-IN CONCRETE FLOOR BOXES AND FIRE-RATED POKE-THRU DEVICES MUST BE INSTALLED IN ACCESSIBLE LOCATIONS.

THE CONSTRUCTION MANAGER (CM) SHALL BE RESPONSIBLE FOR SAW CUTTING THE EXISTING CONCRETE FLOOR FOR INSTALLATION OF EACH FLUSH-IN FLOOR BOX AND ASSOCIATED CONDUIT. THE ELECTRICAL CONTRACTOR SHALL CLOSELY COORDINATE IN THE FIELD WITH THE CM THE LOCATIONS FOR ALL FLUSH-IN FLOOR BOXES AND THE CONDUIT ROUTING REQUIRED FOR EACH FLUSH-IN CONCRETE FLOOR BOX.

THE CONSTRUCTION MANAGER (CM) SHALL BE RESPONSIBLE FOR CORE DRILLING THE EXISTING CONCRETE FLOOR FOR INSTALLATION OF EACH FIRE-RATED POKE-THRU DEVICE. THE ELECTRICAL CONTRACTOR SHALL CLOSELY COORDINATE IN THE FIELD WITH THE CM THE LOCATIONS FOR ALL FIRE-RATED POKE-THRU DEVICES.

ALL CONNECTIONS FROM THE FLUSH-IN FLOOR BOXES AND FIRE-RATED POKE-THRU DEVICES SHALL BE MADE USING LIQUID-TITE FLEXIBLE METAL CONDUIT. ANY ELECTRICAL CONNECTIONS TO ANY OF THE STUDENT LAB STATION DEVICES OR CONTROLS THAT MAY BE BEING FURNISHED IN/ON THE ADJUSTABLE PORTION OF THE STUDENT LAB STATION SHALL BE PROVIDED WITH ADEQUATE LENGTHS OF LIQUID-TITE FLEXIBLE METAL CONDUIT AND CONDUCTORS. 7.SEE THE TYPICAL LAB STATION CONNECTION DETAIL ON THIS DRAWING FOR ADDITIONAL INFORMATION AND WIRING REQUIREMENTS.

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GENERAL SHEET NOTES

- 1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON THE DRAWINGS, EXCEPT ITEMS LISTED ON SHEET E0.01 GENERAL ELECTRICAL NOTES.
- 2. MAXIMUM NUMBER OF 4 INFORMATION OUTLET LOCATIONS PER CONDUIT HOME RUN TO MDF OR IDF IS PERMITTED. CONDUIT SHALL BE SIZED AS FOLLOWS:

1INFORMATION OUTLET LOCATION:1"2INFORMATION OUTLET LOCATIONS:1 1/4"3INFORMATION OUTLET LOCATIONS:1 1/2"

- 3. INSTALL CONDUIT WITH NO MORE THAN (2) 90° BENDS BETWEEN PULL BOXES, AND NO MORE THAN 100'-0" BETWEEN PULL BOXES. PULL BOXES SHALL BE INSTALLED FOR STRAIGHT THRU PULLS ONLY.
- 4. ALL COMMUNICATIONS CABLES SHALL BE INSTALLED IN CONDUIT, CABLE TRAY, OR SUPPORTED BY CABLE HOOKS. PROVIDE BUSHINGS AT THE ENDS OF ALL CONDUIT WHERE STUBBED ABOVE ACCESSIBLE CEILINGS OR WHERE DROPPED INTO CABLE TRAY. PROVIDE CABLE HOOKS ABOVE ACCESSIBLE CEILINGS FOR CABLE INSTALLATION WHERE NOT INSTALLED IN CONDUIT OR CABLE TRAY.
- 5. ALL COMMUNICATIONS CABLES SHALL BE INSTALLED IN CONDUIT OR CABLE TRAY.
- LOCATIONS SHOWN FOR EXISTING EQUIPMENT ARE APPROXIMATE.
- THE AIC RATING FOR ALL NEW CIRCUIT BREAKERS BEING INSTALLED IN EXISTING PANELBOARDS SHALL MATCH THE AIC RATING OF THE EXISTING CIRCUIT BREAKERS LOCATED IN THE EXISTING PANELBOARDS.
- 8. PROVIDE NEATLY TYPED UPDATED PANELBOARD DIRECTORIES IN ALL EXISTING PANELBOARDS BEING WORKED IN FOR THESE RENOVATIONS. THE DIRECTORIES SHALL INDICATE THE EXISTING REMAINING LOADS AND ALL NEW LOADS ADDED AS A RESULT OF THE RENOVATIONS. ALL SPARE CIRCUIT BREAKERS SHALL BE TURNED TO AND LOCKED IN THE 'OFF' POSITION AND IDENTIFIED ON THE DIRECTORIES AS 'SPARE'.
- 9. USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 75 FEET, AND #8 FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 150 FEET AND #10 AWG FOR 20 AMPERE, 277 VOLT CIRCUITS LONGER THAN 150 FEET, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- 10. COORDINATE LOCATION OF ALL ELECTRICAL DEVICES WITH THE ARCHITECTURAL ELEVATONS AND DETAILS, WHICH TAKE PRECEDENCE OVER THE LOCATIONS SHOWN ON THE ELECTRICAL DRAWINGS.

PANELBOARD NOTE

1. THE DESIGN INTENT OF THE RENOVATION IS TO UTILIZE EXISTING PANELBOARDS TO SERVE THE RENOVATED AREAS. PANELBOARDS SHALL BE REPLACED AS REQUIRED WITH ADEQUATE CIRCUIT BREAKERS FOR THE NEW WORK IF DEMOLITION OF EXISTING CIRCUITING DOES NOT MAKE AVAILABLE ENOUGH CIRCUITS.

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POWER KEYNOTES

- 1. PROVIDE A 15 AMP, 2 POLE CIRCUIT BREAKER IN THIS PANELBOARD TO FEED THE NEW FC-1 UNIT BEING INSTALLED IN ROOM #224. SEE POWER KEYNOTE #30 ON DRAWING E1.2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 2. DISCONNECT AND REMOVE THE EXISTING GENERAL ELECTRIC NLAB, FLUSH MOUNTED PANELBOARD P2. MAINTAIN THE FEED TO THIS PANELBOARD AND ALL ASSOCIATED BRANCH CIRCUITS REMAINING AFTER THE PROJECT DEMOLITION HAS BEEN COMPLETED, PROVIDE A NEW 54 CIRCUIT, 120/208 VOLT, THREE PHASE, FOUR WIRE, 225 AMP, MAIN LUG ONLY, FLUSH MOUNTED PANELBOARD IN PLACE OF THE REMOVED PANELBOARD AND RECONNECT THE EXISTING FEED, EXISTING BRANCH CIRCUITS AND THE NEW BRANCH CIRCUITS ASSOCIATED WITH ROOMS #203, 203A & #202 TO THIS NEW PANELBOARD. PRVIDE ONE, 30 AMP, 3 POLE CIRCUIT BREAKER AND TWO, 70 AMP, 2 POLE CIRCUIT BREAKERS FOR EXISTING BRANCH CIRCUITS AND PROVIDE FORTY-SEVEN, 20 AMP, 1 POLE CIRCUIT BREAKERS FOR CONNECTION OF THE NEW AND EXISTING BRANCH CIRCUITS. THE AIC RATING OF THE BRANCH CIRCUIT BREAKERS SHALL MATCH THE AIC RATING OF THE BRANCH CIRCUIT BREAKERS THAT WERE IN THE REMOVED PANELBOARD P2. FIELD VERIFY WHETHER THE TWO, 70 AMP, 2 POLE CIRCUIT BREAKERS IDENTIFIED ON EXISTING PANELBOARD DIRECTORY ARE NEEDED, PRIOR TO PROCESSING SUBMITTALS AND NOTIFY THE ENGINEER IF THERE ARE NO EXISTING CONNECTIONS AT THOSE TWO CIRCUIT BREAKERS, IN WHICH CASE, PROVIDE FOUR ADDITIONAL, 20 AMP, 1 POLE CIRCUIT BREAKERS IN LIEU OF THE TWO, 70 AMP, 2 POLE CIRCUIT BREAKERS. ALL EXISTING REMAINING BRANCH CIRCUITS GETTING CONNECTED TO THIS NEW PANELBOARD SHALL BE TRACED AND SHALL BE PROPERLY IDENTIFIED ON THE PANELBOARD DIRECTORY FOR THE NEW PANELBOARD P2. ALL SPARE CIRCUIT BREAKERS, SHALL BE IDENTIFIED AS SPARES ON THE CIRCUIT DIRECTORY, TURNED TO THE `OFF' POSITION AND LOCKED IN THE `OFF' POSITION.

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- DRAWING E5.1.

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LIGHTING CONTROL NARRATIVE AND PROGRAMMING SEQUENCES '[]'

OL OF THE LIGHT FIXTURES IN THIS ROOM SHALL CONSIST OF A FOUR UTTON ON/OFF/RAISE/LOWER DIMMER SWITCH INSTALLED IN THE VICINITY OF CTOR'S TEACHING STATION AND WITH DIGITAL DIMMING RELAY POWER PACKS ES SHOWN ON THE DRAWINGS. THE BUTTONS FOR THE 4 CHANNEL/BUTTON ITCH SHALL BE PROGRAMMED FOR BUTTON #1 'a' TO PROVIDE CONTROL OF SIGNATED LIGHT FIXTURES. BUTTON #2 SHALL BE PROGRAMMED FOR THE 'b' DESIGNATED LIGHT FIXTURES, BUTTON #3 SHALL BE PROGRAMMED OL OF THE 'c' DESIGNATED LIGHT FIXTURES AND BUTTON #4 SHALL BE ED FOR CONTROL OF THE 'd' OR 'd' & 'e' DESIGNATED LIGHT FIXTURES. L ALSO BE SINGLE CHANNEL DIMMER SWITCH(ES) TO BE PROGRAMMED TO HE 'a', 'b' & 'c' DESIGNATED LIGHT FIXTURES LOCATED IN THIS ROOM TO OUTPUT. THERE WILL ALSO BE SINGLE CHANNEL ON/OFF/RAISE/LOWER TCHES FOR CONTROL OF THE 'd' DESIGNATED UNDERCABINET LIGHT ND FOR CONTROL OF THE 'e' DESIGNATED LIGHT FIXTURES AS SHOWN ON NGS. ALL LIGHT FIXTURES IN THIS ROOM SHALL AUTOMATICALLY TURN OFF IAL TECHNOLOGY, CEILING CORNER MOUNTED VACANCY SENSOR(S) AND DUAL CEILING MOUNTED VACANCY SENSOR, UNLESS OTHERWISE NOTED ON THE SEE LIGHTING CONTROL DETAIL #2 ON DRAWING E5.1.

OL OF THE LIGHT FIXTURES IN THIS ROOM SHALL BE MANUAL SE/LOWER DIMMER SWITCHES IN QUANITIES SHOWN ON THE DRAWINGS FOR INDIVIDUAL CONTROL OF THE 'f' AND 'g' AND IN SOME ROOMS 'h' DESIGNATED LIGHT FIXTURES AS SHOWN ON THE DRAWINGS AND WITH DIGITAL DIMMING RELAY POWER PACKS PROGRAMMED FOR MANUAL ON/OFF/RAISE/LOWER DIMMING AND AUTOMATIC OFF OF ALL LIGHT FIXTURES IN THIS ROOM AFTER FIFTEEN MINUTES OF VACANCY VIA THE DUAL TECHNOLOGY, CEILING, CORNER MOUNTED OCCUPANCY SENSOR OR DUAL TECHNOLOGY CEILING MOUNTED OCCUPANCY SENSOR(S) AS SHOWN ON THE DRAWINGS. SEE LIGHTING CONTROL DETAIL #1 ON DRAWING E5.1.

3. THE CONTROL OF THE LIGHT FIXTURES IN THIS ROOM SHALL CONSIST OF A TWO CHANNEL/BUTTON ON/OFF/RAISE/LOWER DIMMER SWITCH AND WITH DIGITAL DIMMING RELAY POWER PACKS IN QUANTITIES SHOWN ON THE DRAWINGS. THE BUTTONS FOR THE 2 CHANNEL/BUTTON DIMMER SWITCHES SHALL BE PROGRAMMED FOR BUTTON #1 'a' TO PROVIDE CONTROL OF THE 'a' DESIGNATED LIGHT FIXTURES. BUTTON #2 SHALL BE PROGRAMMED FOR CONTROL OF THE 'b' DESIGNATED LIGHT FIXTURES. ALL LIGHT FIXTURES IN THIS ROOM SHALL AUTOMATICALLY TURN OFF VIA THE DUAL TECHNOLOGY, CEILING CORNER MOUNTED VACANCY SENSOR. SEE LIGHTING CONTROL DETAIL #2 ON

4. THE CONTROL OF THIS LIGHT FIXTURE SHALL BE A MANUAL ON/OFF SWITCH CONTROLLED FOR SERVICING EXISTING PANELBOARD P3. AUTOMATIC OFF OF THE LIGHT FIXTURE AT THIS LOCATION IS NOT ALLOWED PER NEC SECTION 110.26 (D). NO LIGHTING CONTROL DETAIL NEEDED.

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YEATON M.E.P. Inc. Bedford, NH Littleton, NH MEP/FP Engineers 603.444.6578 Project #21130MEP29
PROJECT TITLE / ADDRESS: RVCC LAB RENOVATIONS 1 COLLEGE PLACE CLAREMONT NH 03743
SCALE: AS NOTED DWN BY: BCS JOB #: 3773 CHK BY: DLD PRINT DATE: 3/24/2023 2:31:09 PM ISSUE DATE: 03/24/2023 CONSTRUCTION DOCUMENTS
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