PROJECT MANUAL

For

ESWOOD COMMUNITY CONSOLIDATED SCHOOL DISTRICT 269

ESWOOD SCHOOL

ROOFING IMPROVEMENTS SUMMER 2023

304 North Main Street Lindenwood, Illinois 61049

ARCHITECT'S PROJECT NO. 2022052

April 2023



SECTION 000010 - PRE-BID INFORMATION

PRE-BID INFORMATION

for

Eswood School Building Improvements Summer 2023

OWNER:	Eswood Community Consolidated School District 269 304 North Main Street Lindenwood, Illinois 61049
ARCHITECT:	Newman Architecture, Inc. 13437 Redberry Circle Plainfield, Illinois 60544 (630) 400-0055
BID PROPOSALS DUE:	Monday, May 8, 2023 at 3:00 p.m.
BID OPENING TIME:	Monday, May 8, 2023 at 3:00 p.m.
LOCATION:	Eswood School 304 North Main Street Lindenwood, Illinois 61049

PROPOSALS MUST INCLUDE THE FOLLOWING DOCUMENTS:

- 1. Completed Proposal Form furnished by the Architect in duplicate (two copies).
- 2. Bid Bond furnished as per "Instructions to Bidders" in the amount of 10% of the <u>Base</u> Proposal Price.
- 3. Completed Contractor Qualification Form, AIA Document A305, in duplicate (two copies).

ADDITIONAL NOTES:

- 1. Please refer to the "Instructions to Bidders" for BONDING REQUIREMENTS.
- 2. Please refer to "Instructions to Bidders" for CONTRACTOR QUALIFICATION CRITERIA.
- 3. Construction work may commence beginning June 6, 2023.
- 4. Construction work must be completed no later than August 4, 2023.
- 5. A Pre-Bid Meeting and Contractor Walk-through will be held at Eswood School on Monday, May 1, 2023 at 3:00 p.m. Attendance is not required, but is highly recommended.
- 6. All other visits to the School must be approved in advance by the Owner. Please contact Dr. James Hammack at (815) 393-4477 to coordinate.

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Eswood School Roofing Improvements Summer 2023

304 North Main Street Lindenwood, Illinois 61049

for

Eswood Community Consolidated School District 269

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Divisions 3 through 14, 21, 22, 25 and 27 have not been included in the Project Specifications. Should the Contractor require information normally furnished in this Division, he should notify the Architect at once in writing with reference to the specific applications that require additional information.

SECTION 000100 – INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

for

Eswood Community Consolidated School District 269

Eswood School Roofing Improvements Summer 2023

Proposals must be made in accordance with the following instructions in order to be entitled to consideration.

Proposals shall be made in duplicate on forms furnished by the Architect. The wording of the Proposal Form shall not be changed, altered or supplemented except in accordance with the instructions. Proposals shall not contain any recapitulation of the work to be done. All blank spaces shall be filled in.

Proposals shall be based on the following trades:

1. General Construction Work

Proposals shall be sealed in an opaque envelope, marked and addressed as follows:

Proposal for Eswood Community Consolidated School District 269

Eswood School Building Improvements Summer 2023

c/o Kirsten Garrigan Eswood Community Consolidated School District 269 304 North Main Street Lindenwood, Illinois 61049

Proposals shall be delivered or mailed in time for delivery at the above address by 3:00 p.m., Local Time, Monday, February 8, 2023, at which time they will be publicly opened and read aloud. Proposals received after this time will not be considered and will be returned unopened. Faxed or electronically transmitted bids will not be considered. All bidders are welcome to attend the bid opening.

Proposals must be signed by an authorized official of the contractor's organization and the name of the official and his title typed below his signature.

All erasures or corrections on the proposal must be initialed by the official signing the bid.

Each bid shall be accompanied by a bid bond, an approved corporate surety, a certified check, cash or a bank draft made payable to "Eswood Community Consolidated School District 269," in an amount not less than 10% of the Base Proposal Price. The Bid Bond is to guarantee that, if awarded the Contract within the time stipulated for amounts and conditions described in the bidding documents, the bidder will enter into the Contract with the Owner and furnish the prescribed Performance Bond and Labor and Material Payment Bond. If the bidder fails to do so without justification as may be allowed elsewhere in the Contract Documents, there shall be paid to the Owner the difference, not to exceed the penal sum of the bond, between the bidder's bid and such larger amount for which the Owner may in good faith contract with another party to perform the Work covered by said bid.

The successful bidder will be required to provide a Performance Bond and a Labor and Material Payment Bond. The premium for such bond shall be paid by the contractor and shall be included in the bid. The value of the Performance Bond and Labor and Material Payment Bond shall be 100% of the Base Proposal Price. Such bonds shall be in a form and with a surety acceptable to the Owner and shall not include a limitation period shorter than that provided by Illinois law. Under all circumstances, each contractor will be required to provide a Bid Bond with his proposal as noted in the previous paragraph.

A "Contractor's Qualification Statement" must be submitted with the completed Bid Proposal. (Refer to Section 000305)

Prior to contract award, the Owner shall, at its discretion, review the bidder's prior experience, references, financial status and proposed subcontractors. The Owner may consider these and other factors in awarding the contract. It is the intention of the Owner to award the Contract to the lowest responsible, responsive, base bidder complying with the requirements of the Contract and best meeting the requirements of Eswood Community Consolidated School District 269, considering not only cost, but suitability for intended use, conformity with the specifications, terms of delivery, quality, training and serviceability, as applicable.

The Owner reserves the right to reject any and all bids or parts thereof and to waive any technicalities and irregularities in the bidding and to disregard all non-conforming or conditional bids or counter proposals, to accept the bid which it considers most favorable to the Eswood Community Consolidated School District 269, and to hold the bid proposals for a period of sixty (60) calendar days from the date of opening above set forth. The Owner specifically reserves the right to reject any bid if it is determined that the bidder is not properly qualified to carry out the obligations of the Contract.

Any bidder may withdraw his proposal at any time prior to the scheduled bid opening.

Construction Documents and Specifications will be available for contractors from the office of the Architect, Newman Architecture, 13437 Redberry Circle, Plainfield, Illinois 60544, (630) 400-0055 for download from the Architect.

Before submitting a proposal, bidders shall carefully examine the Contract Documents, visit the site, and fully inform themselves of all existing conditions and limitations. Failure to do so will be at the Bidder's own risk and will not be cause for relief on a plea of error. Should a bidder find discrepancies in or omissions from the Contract Documents, or should he be in doubt as to their meaning, he should at once notify the Architect prior to submitting a proposal. Any interpretation or correction will be issued as an Addendum by the Architect to all bidders. Only a written interpretation or correction by Addendum shall be binding. No bidder shall rely upon any interpretation or correction given by any other method. The submission of a bid will constitute an incontrovertible representation by the Bidder that he has complied with every such requirement and that the Bid Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for furnishing the goods and special services.

The Owner will not approve any additional payments to Bidder for conditions which would have been disclosed to the Bidder by examining the Bid Documents and visiting the site prior to the bid opening.

The Bidder shall at all times observe and comply with all applicable laws, regulations and rules promulgated by all federal, State, county, municipal and/or other governmental units or regulatory bodies now in effect or which may be in effect during the performance of the Contract. Included within the scope of the laws, regulations and rules referred to in this paragraph, but in no way to operate as a limitation, are all forms of traffic regulations, public utility and Intrastate Commerce Commission regulations, Worker's Compensation Laws, the Social Security Act, Occupational Safety and Health Act, the Consumer Product Safety Act, the Illinois School Code and the Illinois Motor Vehicle Code.

Additionally, the Contractor shall comply with all laws and regulations pertaining to Equal Opportunity and Fair Employment Practices including the Illinois Human Rights Act. The Contractor shall not discriminate against any worker, employee or applicant, or any other member of the public because of race, religion, color, age, sex, handicap, marital status, national origin or unsatisfactory military discharge, nor otherwise commit an unfair labor practice.

Where indicated on the Proposal Form, the selected bidder is required to submit the names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for such portions of the Work as may be designated in the bidding documents or, if no portions are so designated, the names of the Subcontractors proposed for principal portions of the Work. The bidder will be required

to establish, to the satisfaction of the Architect and the Owner, the reliability and responsibility of the proposed Subcontractors to furnish and perform the Work described in the Sections of the Specifications pertaining to such proposed Subcontractors' respective trades. Prior to the award of the Contract, the Architect will notify the bidder in writing if either the Owner or the Architect, after due investigation, has reasonable and substantial objection to any person or organization on such list. If the Owner or Architect has a reasonable and substantial objection to any person or organization on such list, and refuses in writing to accept such person or organization, the bidder may, at his option, withdraw his bid without forfeiture of bid security, notwithstanding anything to the contrary contained in The Instructions to Bidders or any of these Contract Documents. If the bidder submits an acceptable substitute with an increase in his bid price to cover the difference in cost occasioned by such substitution, the Owner may, at his discretion, accept the increased bid price or he may disqualify the bidder. Subcontractors and other persons and organizations proposed by the bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be discharged except with the written approval of the Owner and the Architect.

Bids may be withdrawn by written request received from the Bidder at any time prior to the scheduled bid opening. No bid may be withdrawn for a period of sixty (60) calendar days after the bid opening date without the written consent of Eswood Community Consolidated School District 269.

Contractors and vendors shall not charge Federal Excise Tax or State Tax or Illinois Retailers Occupational Tax, since Eswood Community Consolidated School District 269 is a tax-exempt body. Proof of tax-exempt status is available upon request.

The successful bidder will be responsible for obtaining any and all permits, approvals and occupancy certificates, applicable on the date of the acceptance of the bid, for the complete installation of the required work.

PREVAILING WAGE

The successful Bidder shall pay not less than the general prevailing rate of hourly wages for work of a similar character in the locality in which the work is performed and not less than general prevailing rate of hourly wages for legal holidays and overtime work in the performance of work under this Contract, as established by the Illinois Department of Labor, pursuant to an act of the General Assembly of the state of Illinois approved June 26, 1941 as amended according to the Illinois Compiled Laws, Ch. 820, Sec. 130/0.01, et seq.

- A contractor or subcontractor participating in public works project must also submit a Certified Payroll to the public body no later than the 10th day of every month. This Certified Payroll must consist of a complete copy of the records required to be kept under Section 5(a) (1) of the Act, discussed above (with the exception of daily work starting and ending times). See: Illinois Prevailing Wage Act (820 ILCS 130/5(a) (2)) (the "Act").
- The monthly Certified Payroll shall also include a statement signed by the contractor or subcontractor submitting that: (1) the records are true and accurate; (2) the hourly rate paid to each worker is not less than the general prevailing wage rate required; and (3) the contractor or subcontractor is aware that filing a Certified Payroll that he or she knows to be false is a class A misdemeanor. See: 820 ILCS 130/5(a)(2).
- The Act requires that a public body shall keep all Certified Payrolls submitted pursuant to the Act for at least three years. See: 820 ILCS 130/5(a)(2).

Failure to comply with the Act's Requirements:

- No public works project may be instituted unless the provisions of the act have been met. Contracts that are not in compliance with the Act's prerequisites are void as against public policy. See 820 ILCS 103/11.
- Please note that this is not a complete list of all relevant requirements and prerequisites under the Act. All contractors and subcontractors rendering services under this contract must comply with all requirements of the Act, including but not limited to, all wage, notice and record keeping duties. For a full understanding of all of the Act's requirements and prerequisites, as well as the text of the Act and all related regulations, please see the Illinois Department of Labor's website at www.state.il.us/agency/idol/laws/Law130lhtm.

If the Department of Labor revises the prevailing rate of hourly wages to be paid by Eswood Community Consolidated School District 269, the revised rate shall apply to any contract entered into hereunder. The prevailing rate of wages are revised by the Department of Labor and are available on the Department's official website.

CONTRACTOR QUALIFICATION CRITERIA

General Contractors interested in bidding this project should meet the following minimum requirements:

- 1. Firms shall be licensed to do business in the State of Illinois.
- 2. Firms shall be in and maintain compliance with the Owner's Fair Employment Practices Agreement, the Federal Civil Rights Act and the Illinois Fair Employment Practices Act.
- 3. Firms shall be of sound financial status.
- 4. Firms shall have a minimum of 5 years documented experience in the General Contracting and construction of projects similar to the size and scope of this Project.
- 5. Firms shall have experience in the General Contracting and construction work with similar materials, assemblies, class of construction and complexities.
 - (a) Firms shall have experience in renovation work.
 - (b) Firms shall have experience in working in and around an existing facility that will remain occupied and operated by the Owner. This includes experience in construction and maintenance of temporary construction barriers.
- 6. Firms shall be free of encumbering legal actions or firm history of judgments, claims, and arbitration proceedings.
- 7. Firm shall have the human and physical resources available to complete the work to the quality levels specified in a timely manner.
- 8. Firms shall be capable of obtaining the necessary bonds required for bidding and contracting the project.
 - (a) List the name, location and telephone number of the account representatives with the bonding company (not the agent) in Article 4.3.1 of the Contractor's Qualification Statement.
- 9. Firms shall be of good standing in the construction industry with suppliers, tradesman, and sub-contractors.

ADDITIONAL CONDITIONS:

The successful bidder will:

- 1. Complete the Project in accordance with all applicable statutes, codes and regulations.
- 2. Submit to the Eswood Community Consolidated School District 269 prior to the start of Work a certificate of insurance or other evidence of insurance satisfactory to the School District showing the School District as a named insured under the bidder's insurance coverage. Refer to Section 000812.
- 3. Indemnify, defend and hold harmless the Eswood Community Consolidated School District 269 and Architect, their agents, officials, employees and other persons acting on behalf of the School District from and against all injuries, deaths, loss, damages, claims, suits, liabilities, judgments, costs and attorney's fees resulting from, arising out of or as a consequence of the Project.
- 4. Be an independent contractor and not an agent, employee or a person or agency acting on behalf of the School District.
- 5. Perform all work in conformance with the material and equipment manufacturer's and applicable industry written specifications and recommendations applicable to the work.

SECTION 000305 – CONTRACTOR'S QUALIFICATION STATEMENT

CONTRACTOR'S QUALIFICATION STATEMENT

The American Institute of Architect's Document A305, 1986 Edition, entitled "Contractor's Qualification Statement," must be completed and submitted with the completed Proposal Form in order to be considered for this project.

General Construction Work CONTRACTOR: Identify Trade

BID PROPOSAL FORM

for

Eswood Community Consolidated School District 269

Eswood School Roofing Improvements Summer 2023

Please Review Section 000100 of Specifications for Bonding Requirements A BID BOND of 10% of Base Proposal Price and Contractor's Qualification Statement are REQUIRED with Proposal for Proposal to be considered.

Submitted By: _____

Address: _____

Date:_____Phone:_____

SCOPE:

The undersigned hereby proposes to furnish all materials and do all the work required for the trade indicated at the top of the page for the Eswood Community Consolidated School District 269 at Eswood School, in strict accordance with the Contract Documents prepared for the same by Newman Architecture, 13437 Redberry Circle, Plainfield, Illinois 60544, and on file in the office of the Architect for the sums indicated below. The undersigned further agrees that he is bound by all conditions as printed in the "Instructions to Bidders" submitted by the Architect for this proposal.

BASE PROPOSAL PRICE:

Base Proposal: Dollars: Estimated Starting Date: Estimated Completion Date: _____ Name of Proposed Project Manager/Superintendent: _____

Project 2022052 Newman Architecture

ADDENDA ACKNOWLEDGMENT:

Acknowledge rece	ipt of all Adden	da received below by nu	mber and date.			
Addendum No.	Date	Addendum No.	Date	Addendum No.	Date	
Addendum No.	Date	Addendum No.	Date	Addendum No.	Date	
ALTERNATES: (Clearly indicate where the second second	(See Section 012 hether the modif	2300 of Project Manual) ication is an addition to (or a deduction fi	rom the Base Proposal Price		
Alternate No. 1:						
Amount:				\$		
Alternate No. 2:	Alternate No. 2:					
Amount:	Amount:\$					
Alternate No. 3:						
Amount:\$						
Alternate No. 4:						
Amount:				\$		
<u>UNIT PRICES</u> : (See Section 012200 of the Project Manual)						
Unit Price #1:						

The amount to be added to the Contract Sum to:

Amount:	.\$
Unit Price #2:	
The amount to be added to the Contract Sum to:	
Amount:	\$
Unit Price #3:	
The amount to be added to the Contract Sum to:	
Amount:	\$

Project 2022052 Newman Architecture

SUBCONTRACTORS:

The undersigned proposes to employ the following subcontractors for portions of the Work noted. (Attach sheet as required.)

SUBCONTRACTOR

SECTION

Name: Address:

Name: Address:

Name: Address:

Name: Address:

WORK PERFORMED DIRECTLY:

The undersigned proposes to perform work on the following portions of the Work directly without subcontractors: (Attach sheet as required)

SECTION

The undersigned agrees, if awarded the Contract, to begin work immediately upon notification by the Architect in writing.

IF AN INDIVIDUAL:

Long-Hand Signature of Bidder:_____

Doing Business As:_____

Business Address:

IF A PARTNERSHIP:

Name of Firm:		
By:		
Business Address:		
Attach sheet with t	he names and addresses o	f all members of the partnership.

IF A CORPORAT	ION:	
Corporate Name: _		
State of Incorporat	ion:	
Ву:		Corporate
	(President)	Seal
Business Address:		
Names	(President:	
of Officers	(Secretary: (Treasurer: ((Secretary:	

Eswood School Roofing Improvements Summer 202	23	April 2023
ATTEST:		
STATE OF ILLINOIS)		
COUNTY OF)		
Ι	, a Notary Public	in and for said County in said State, do hereby
identify that		
President and		Secretary of
	_a corporation, w	ho are each personally known to be such
President and such Secretary, appeared before me this	day in person and	severally acknowledge that they signed, sealed
and delivered the foregoing instrument as their free an	nd voluntary act of,	,
a Corporation, for the uses and purposes set forth there	in.	
Given under my hand and Notarial Seal this	day of	, 20 A.D.
My Commission Expires		
		Notary Public
		Notary Seal

CONTRACTOR CERTIFICATIONS

Must be signed for Proposal to be considered

The contractor/vendor certifies that the contractor is not barred from bidding on the contract as a result of a conviction for either bid-rigging or bid rotating under Article 33E of the Criminal Code of 1961, as amended.

Contractor/Vendor Signature

The undersigned hereby certifies that the Bidder is in compliance with the Equal Employment Opportunity Clause and the Illinois Fair Employment Practices Act as stated under Compliance with Legislation in Instructions to Bidder.

Contractor/Vendor Signature

The undersigned hereby certifies that having submitted a bid proposal to Eswood Community Consolidated School District 269, that same bidder has a written sexual harassment policy in place and is in compliance with P.A. 87-1275.

Contractor/Vendor Signature

The undersigned which has 25 or more employees does hereby certify pursuant to Section 3 of the Illinois Drug-Free Workplace Act (III. Rev. Stat. Ch. 127, par. 132313) that the Bidder shall provide a drug-free Workplace for all employees engaged in the performance of work under the contract by complying with the Requirements of the Illinois Drug-Free Workplace Act.

Contractor/Vendor Signature

The undersigned hereby certifies that criminal background checks have been performed on all personnel that will be performing work in Eswood Community Consolidated School District 269.

Contractor/Vendor Signature

The undersigned hereby certifies he has read, understands, and agrees that acceptance by Eswood Community Consolidated School District 269 of the Bidder's offer by issuance of a written contract (specifications and bidding conditions contained therein) will create a binding agreement between the parties.

CERTIFICATE OF ELIGIBILITY TO BID

(Bidder), pursuant to Section 33E-11 of the Illinois criminal code of 1961, as amended, hereby certifies that neither (he, she, its) partners, officers, or owners of (his, her, its) business have been convicted in the past five (5) years of the offenses of bid-rigging under Section 33E-3 of the Illinois Criminal Code of 1961, as amended and that (his, her, its) business has ever been convicted of the offense of bid-rotating under Section 33E-4 of the Illinois Criminal code of 1961, as amended.

The Bidder further certifies that neither (he, she, its) partners, officers or owners of (his, her, its) business is barred from bidding for or entering into a contract under Section 10-20.21 of the Illinois School Code (105 ILCS 5/10-20.21) and that the Bidder acknowledges that Eswood Community Consolidated School District 269, Eswood School may declare the contract void if such certification is false.

Company Submitting Bid:
Authorized Signature:
Typed or Printed Name:
Title:
Date:

NON COLLUSIVE BIDDING CERTIFICATION

By submission of this bid or proposal, the bidder certifies that:

- 1. This bid or proposal has been independently arrived at without collusion with any other bidder or with any competitor.
- 2. This bid or proposal has not been knowingly disclosed and will not be knowingly disclosed prior to the opening of bids or proposals for this project to any other bidder, competitor or potential competitor.
- 3. No attempt has been or will be made to induce any other person, partnership or corporation to submit a bid or proposal.
- 4. The person signing the bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the penalties being applicable to the bidder as well as to the person signing in its behalf.

Company Submitting Bid:
Authorized Signature:
Typed or Printed Name:
Title:
Date:

END OF SECTION 000310

Project 2022052 Newman Architecture

SECTION 000503 - OWNER-CONTRACTOR AGREEMENT

OWNER-CONTRACTOR AGREEMENT

The American Institute of Architect's Document A101, entitled "Standard Form of Agreement Between Owner and Contractor" 2017 Edition, will form the basis for the Owner and Contractor's Agreement.

SECTION 000703 - GENERAL CONDITIONS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The American Institute of Architects' Document A201, 2017 Edition, entitled "General Conditions of the Contract for Construction," is hereby made a part of these Specifications in its entirety.

SECTION 000812 - SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction." Where any Article of the General Conditions is modified, or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 1 GENERAL PROVISIONS

No Modifications.

ARTICLE 2 OWNER

No Modifications.

ARTICLE 3 CONTRACTOR

Add the following Subparagraph 3.6.1:

3.6.1 The Owner is exempt from sales tax on products permanently incorporated in the facilities and therefore these taxes shall not be included in the proposal. Contractors shall caution their subcontractors accordingly. Exemption Certificates will be furnished by the Owner to the Contractor upon request.

ARTICLE 4 ARCHITECT

No Modifications.

ARTICLE 5 SUBCONTRACTORS

No Modifications.

<u>ARTICLE 6</u> CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No Modifications.

ARTICLE 7 CHANGES IN THE WORK

No Modifications.

Project 2022052 Newman Architecture ARTICLE 8 TIME

No Modifications.

ARTICLE 9 PAYMENTS AND COMPLETION

Add the following Clause 9.10.1.1:

9.10.1.1 Before the final payment is made, the Contractor shall submit to the Architect, in duplicate, final waivers of lien from all Subcontractors and material suppliers in the full amount of the Subcontract for materials supplied to the Contractor applicable to the Work. In addition, the Contractor shall submit to the Architect the Contractor's Final Waiver of Lien for the full amount of the Contract Sum including authorized Change Orders. See Section 012900 for Payment Procedure.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

No Modifications.

ARTICLE 11 INSURANCE AND BONDS

Add the following Clause 11.1.2.1:

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following, or greater if required by law:

- 1. Workers' Compensation:
 - (a) State: Statutory
 - (b)Employer's Liability:
Bodily Injury by Accident Each Accident
Bodily Injury by Disease Policy Limit
Bodily Injury by Disease Each Employee\$500,000Bodily Injury by Disease Each Employee\$500,000
- 2. Comprehensive General Liability (including coverage for Premises and Operations, Contractors' Protective Liability, Broad Form Property Damage, and Personal Injury Liability):
 - (a) Combined Single Limit Coverage:
 \$1,000,000.00 for Bodily Injury and Property Damage per occurrence and \$2,000,000.00 per aggregate limit.
 - (b) Products and Completed Operations to be maintained for one year after final payment.
 - (c) Where the hazard exists, the contractor shall purchase and maintain insurance to protect against claims for explosive, collapse or underground damage. This includes any contractor whose work exposes the contractor to an applicable potential loss.
- 3. Comprehensive Automobile Liability (including coverage of Owned, Non-Owned and Hired Vehicles):
 - (a) Combined Single Limit Coverage:
 - \$1,000,000.00 for Bodily Injury and Property Damage per occurrence and in the same aggregate limit.
- 4. Umbrella Excess Liability:
 - (a) \$2,000,000.00 over primary insurance.

Add the following Clauses 11.1.3.1 and 11.1.3.2:

11.1.3.1 The Certificate of Insurance shall list the Owner, the Architect, and the Eswood Community Consolidated School District 269, Eswood School as additional insureds on a primary and non-contributory basis covered under the contractor's required policies.

Eswood School Roofing Improvements Summer 2023

11.1.3.2 The Contractor shall furnish two copies of each Certificate of Insurance herein required which shall specifically set forth evidence of all coverages required by Subparagraphs 11.1.1, 11.1.2 and 11.1.3. The form of the Certificate shall be equal to the Acord 25. The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.

Add the following Subparagraphs 11.1.5 and 11.1.6:

11.1.5 Insurance required by this Paragraph 11.1 shall be written with a company having at least an "A" as listed in Best Insurance Guide, latest edition.

11.1.6 The Owner, the Architect and the Eswood Community Consolidated School District 269, Eswood School shall each be notified a minimum of 30 days prior to the modification or termination of any policy required by contract.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

No Modifications.

ARTICLE 13 MISCELLANEOUS PROVISIONS

No Modifications.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

No Modifications.

ARTICLE 15 CLAIMS AND DISPUTES

No Modifications

Add the following Articles 16, 17 and 18:

ARTICLE 16 EQUAL OPPORTUNITY

16.1 The Contractor shall maintain policies of employment as follows:

16.1.1 The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin or age. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

16.1.2 The Contractor and all Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or age.

ARTICLE 17 ADDITIONAL PROVISIONS

17.1 WAGE RATES

17.1.1 The Contractor shall comply with the requirements of Sections 39S1 through 39S12, Chapter 48 of the Illinois Revised Statutes with reference to prevailing rates of wages. He shall pay, or cause to be paid, not less than the prevailing rates of wages as found by the owner or Department of Labor or as determined by the Court on review to all laborers, workmen and mechanics.

ARTICLE 18 DRAWINGS

18.1 The Construction Documents include the following Drawings:

Sheet No.	Title
T-1	TITLE SHEET / GENERAL PROJECT INFORMATION

ARCHITECTURAL

A2-0	SITE PLAN
A2-1	PARTIAL FIRST FLOOR PLAN
A2-R	PARTIAL ROOF PLAN
A3-1	ENLARGED PLANS & REFLECTED CEILING PLANS & DETAILS

MECHANICAL

HV2-1	ENLARGED HVAC PLANS
HV2-R	HVAC ROOF PLAN
HV3-1	HVAC SCHEDULES, SYMBOLS, AND DETAILS

ELECTRICAL

ED2-1	PARTIAL FIRST FLOOR ELECTRICAL DEMOLITION PLAN
E2-1	PARTIAL FIRST FLOOR ELECTRICAL PLAN
E2-2	ELECTRICAL SITE PLAN
E3-1	ELECTRICAL SYMBOLS AND DETAILS

SECTION 000850 – PREVAILING RATE OF WAGES

PART 1 - GENERAL

1.1 PREVAILING WAGE RATES

- A. The following link directs you to the list of Illinois Department of Labor prevailing rate of wages for the county where the contract is being performed and for each craft or type of worker needed to execute the contract. <u>https://idol.aem-int.illinois.gov/content/dam/soi/en/web/idol/laws-rules/conmed/documents/2023-rates/apr_1/Ogle.pdf</u>
- B. The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications / counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Contractor's use of site and premises.
- 4. Coordination with occupants.
- 5. Work restrictions.
- 6. Specification and Drawing conventions.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 DEFINITIONS

2.

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

- A. Project Identification: 2022027.
 1. Project Location: 304 North Main Street, Lindenwood, Illinois, 61049, United States.
- B. Owner: Board of Education Eswood Community Consolidated School District 269, 304 North Main Street, Lindenwood, Illinois, 61049, United States.
 - 1. Owner's Representative: Kirsten Garrigan, Superintendent.
- C. Architect: Newman Architecture, 13437 Redberry Circle, Plainfield, Illinois, 60544.
- D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:
 - 1. MEP Engineer: 20/10 Engineering Group, LLC.
 - 2. Structural Engineer: Johnson Wilbur Adams, Inc.
- E. Web-Based Project Software: Project software may be used for the purposes of managing communication and documents during the construction stage.
 - 1. See Section 013100 "Project Management and Coordination." for requirements for using webbased Project software.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 - 1. Complete tear-off and replacement of a portion of the existing roofing system.
 - Modifications to Boys 104 and Girls 106, including:
 - a. Installation of new suspended ceiling systems.

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- b. Relocate existing equipment above the new suspended ceiling system to below the new ceiling system.
- c. Replacement of toilet room exhaust systems.
- d. Replacement of existing space heaters with ceiling mounted radiant panels.
- e. Replacement of lighting with LED panels.
- f. Undercut doors 104 & 106.
- 3. Replacement of 3 exterior area light fixtures with LED flood lights.
- 4. The installation of a new flood light on the east side of the bus garage.
- 5. All other work noted on the drawings and specifications.
- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1.8 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

- B. On-Site Work Hours: Limit work to between 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
 - Weekend Hours: Comply with regulations by authorities having jurisdiction for restrictions on 1. work hours.
 - 2. Early Morning Hours: Comply with regulations by authorities having jurisdiction for restrictions on noisy work.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - Notify Owner not less than two days in advance of proposed utility interruptions. 1.
- D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner. 1.
 - Notify Owner not less than two days in advance of proposed disruptive operations.
- E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances within the existing building and on Owner's property is not permitted.
- F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- Specification Content: The Specifications use certain conventions for the style of language and the A. intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - Imperative mood and streamlined language are generally used in the Specifications. The words 1. "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - Text Color: Text used in the Specifications, including units of measure, manufacturer and product 2. names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 - 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 - 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- Β. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - Terminology: Materials and products are identified by the typical generic terms used in the 1. individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 **SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following: Lump-sum allowances. 1
- C. **Related Requirements:**
 - Section 012200 "Unit Prices" for procedures for using unit prices, including adjustment of 1. quantity allowances when applicable.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional A. requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in A. fulfillment of each allowance.
- Β. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

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ALLOWANCES 012100 - 1

- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-inplace where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Lump-Sum Allowance: Include the sum of Five Thousand Dollars (\$5,000.00). Include replacement of select sections of sidewalk.
 - 1. This allowance includes material cost receiving, handling, and installation and Contractor overhead and profit.
 - 2. Coordinate with corresponding unit-price requirements in Section 012200 "Unit Prices."

END OF SECTION 012100

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SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

- 1. Section 012100 "Allowances" for procedures for using unit prices.
- 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

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

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the Part 3 "Schedule of Unit Prices" Article contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Removal and replacement of select sections of concrete sidewalks.
 - 1. Description: Cutting of existing concrete sidewalks up to 6 inches (152 mm) thick, removal and excavation as required, and subsequent backfill, compaction, and patching of concrete sidewalks in accordance with Section 017300 "Execution." not otherwise indicated in the Contract Documents.
 - 2. Unit of Measurement: square feet of concrete sidewalk.
 - 3. Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

END OF SECTION 012200

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SECTION 012300 - ALTERNATES

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 alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other Work of the Contract.
- C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.
- PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. None at time of initial issue for bidding.

SECTION 012500 - 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 012100 "Allowances" for products selected under an allowance.
- 2. Section 012300 "Alternates" for products selected under an alternate.
- 3. Section 016000 "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 acceptable to Architect.
 - 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 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. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - h. 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.

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SUBSTITUTION PROCEDURES 012500 - 1

- i. Cost information, including a proposal of change, if any, in the Contract Sum.
- j. 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.
- k. 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 five days after the Notice to Proceed . 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.

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SUBSTITUTION PROCEDURES 012500 - 2

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- 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)

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

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

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect .
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect .
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

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- 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
- 7. Proposal Request Form: Use form acceptable to Architect .

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive . Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)
SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

1.3 DEFINITIONS

1.

2.

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

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use CSI Master Format as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Owner's name.
 - c. Name of Architect.
 - d. Architect's Project number.
 - e. Contractor's name and address.
 - f. Date of submittal.
 - Arrange schedule of values consistent with format of AIA Document G703.
 - 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest onehundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.

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- 2) Materials.
- 3) Equipment.
- 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
- 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
- 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show lineitem value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- 7. Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
- 8. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
- 9. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
- 10. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 - 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values.
 - 3. Contractor's construction schedule (preliminary if not final).
 - 4. Products list (preliminary if not final).
 - 5. Schedule of unit prices.
 - 6. Submittal schedule (preliminary if not final).
 - 7. List of Contractor's staff assignments.
 - 8. List of Contractor's principal consultants.
 - 9. Copies of building permits.
 - 10. Certificates of insurance and insurance policies.
 - 11. Performance and payment bonds.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - 1. Evidence of completion of Project closeout requirements.
 - 2. Certification of completion of final punch list items.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706.
 - 5. AIA Document G706A.
 - 6. AIA Document G707.
 - 7. Evidence that claims have been settled.
 - 8. Waivers and releases.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

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 provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. RFIs.
 - 3. Digital project management procedures.
 - 4. Web-based Project management software package.
 - 5. Project meetings.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and fieldengineering services, including establishment of benchmarks and control points.
 - 2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.

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- 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
- 3. Make adequate provisions to accommodate items scheduled for later installation.
- Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with Β. other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - Progress meetings. 5.
 - Preinstallation conferences. 6.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.
- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials. Coordinate use of temporary facilities to minimize waste.

1.6 **REQUEST FOR INFORMATION (RFI)**

- General: Immediately on discovery of the need for additional information, clarification, or interpretation A. of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - Architect will return without response those RFIs submitted to Architect by other entities 1. controlled by Contractor.
 - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - Project name. 1.
 - 2. Name of Architect.
 - 3. Architect's Project number.
 - 4. Date.
 - 5. Name of Contractor.
 - RFI number, numbered sequentially. 6.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - Field dimensions and conditions, as appropriate. 10.
 - Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time 11. or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - Include dimensions, thicknesses, structural grid references, and details of affected a. materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
 - Attachments shall be electronic files in PDF format. 1
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. 1.
 - The following Contractor-generated RFIs will be returned without action:

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- a. Requests for approval of submittals.
- b. Requests for approval of substitutions.
- c. Requests for approval of Contractor's means and methods.
- d. Requests for coordination information already indicated in the Contract Documents.
- e. Requests for adjustments in the Contract Time or the Contract Sum.
- f. Requests for interpretation of Architect's actions on submittals.
- g. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
- 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly or at Construction Progress meetings . Include the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number, including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.
 - 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawings may be provided by Architect for Contractor's use during construction.
 - 1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
 - 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 - 3. Digital Drawing Software Program: Contract Drawings are available in .dwg format .
 - 4. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.
 - a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.
 - 5. The following digital data files may be furnished for each appropriate discipline:
 - a. Floor plans.
- B. Web-Based Project Management Software Package: Contractor may provide, administer, and use webbased Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.
 - 1. Web-based Project management software includes, at a minimum, the following features:
 - a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.

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- c. Document workflow planning, allowing customization of workflow between project entities.
- d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
- e. Track status of each Project communication in real time, and log time and date when responses are provided.
- f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
- g. Processing and tracking of payment applications.
- h. Processing and tracking of contract modifications.
- i. Creating and distributing meeting minutes.
- j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
- k. Management of construction progress photographs.
- 1. Mobile device compatibility, including smartphones and tablets.
- 2. Provide up to seven Project management software user licenses for use of Owner, Architect, and Architect's consultants. Provide eight hours of software training at Architect's office for web-based Project software users.
- 3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
 - 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 business days prior to meeting.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Critical work sequencing and long lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Use of web-based Project software.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for RFIs.

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- i. Procedures for testing and inspecting.
- j. Procedures for processing Applications for Payment.
- k. Distribution of the Contract Documents.
- 1. Submittal procedures.
- m. Preparation of Record Documents.
- n. Use of the premises and existing building.
- o. Work restrictions.
- p. Working hours.
- q. Owner's occupancy requirements.
- r. Responsibility for temporary facilities and controls.
- s. Procedures for moisture and mold control.
- t. Procedures for disruptions and shutdowns.
- u. Construction waste management and recycling.
- v. Parking availability.
- w. Office, work, and storage areas.
- x. Equipment deliveries and priorities.
- y. First aid.
- z. Security.
- aa. Progress cleaning.
- 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at biweekly intervals.
 - 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.

b.

- 7) Site use.
- 8) Temporary facilities and controls.
- 9) Progress cleaning.
- 10) Quality and work standards.
- 11) Status of correction of deficient items.
- 12) Field observations.
- 13) Status of RFIs.
- 14) Status of Proposal Requests.
- 15) Pending changes.
- 16) Status of Change Orders.
- 17) Pending claims and disputes.
- 18) Documentation of information for payment requests.
- 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

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Schedule Updating: Revise Contractor's construction schedule after each progress meeting, a. where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Submittal schedule requirements.
- 2. Administrative and procedural requirements for submittals.

B. Related Requirements:

- 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
- 2. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
- 3. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
- 4. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
- 5. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
- 6. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
 - 3. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.

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- d. Name of subcontractor.
- e. Description of the Work covered.
- f. Scheduled date for Architect's final release or approval.
- g. Scheduled date of fabrication.
- h. Scheduled dates for installation.

1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
 - 1. Project name.
 - 2. Date.
 - 3. Name of Architect.
 - 4. Name of Contractor.
 - 5. Name of firm or entity that prepared submittal.
 - 6. Names of subcontractor, manufacturer, and supplier.
 - 7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 - 8. Category and type of submittal.
 - 9. Submittal purpose and description.
 - 10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 - 11. Drawing number and detail references, as appropriate.
 - 12. Indication of full or partial submittal.
 - 13. Location(s) where product is to be installed, as appropriate.
 - 14. Other necessary identification.
 - 15. Remarks.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to webbased Project management software website. Enter required data in web-based software site to fully identify submittal.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

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SUBMITTAL PROCEDURES

- 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
- 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - Architect reserves the right to withhold action on a submittal requiring coordination with a. other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if 1. coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 - Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be 4. transmitted simultaneously to Architect and to Architect's consultants, allow 21 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- Resubmittals: Make resubmittals in same form and number of copies as initial submittal. D.
 - Note date and content of previous submittal. 1.
 - 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, E. installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- Product Data: Collect information into a single submittal for each element of construction and type of A. product or equipment.
 - If information must be specially prepared for submittal because standard published data are 1 unsuitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - Manufacturer's catalog cuts. a.
 - Manufacturer's product specifications. b.
 - Standard color charts. c.
 - d. Statement of compliance with specified referenced standards.
 - Testing by recognized testing agency. e.
 - f. Application of testing agency labels and seals.
 - Notation of coordination requirements. g.
 - Availability and delivery time information. h.
 - For equipment, include the following in addition to the above, as applicable: 4.
 - Wiring diagrams that show factory-installed wiring. a.
 - Printed performance curves. b.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

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SUBMITTAL PROCEDURES

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- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
 - 1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 - Identification: Permanently attach label on unexposed side of Samples that includes the following:
 a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 - 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 - 4. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to webbased Project software website. Enter required data in web-based software site to fully identify submittal.
 - 5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - 7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit one set of Samples. Architect will mark up and return one Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

- 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
 - 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 - 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 - 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 - 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 - 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 - 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
 - 1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
 - 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 - 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 - 4. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

1.8 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 insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file, 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.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required , and return.
 - 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action .
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.
- PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 014000 - 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. 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.
- E. 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.
- F. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

- G. 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."
- H. 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.
- I. 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 quality-control services do not include contract administration activities performed by Architect.

1.4 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.
- Β. 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.

1.5 CONFLICTING REQUIREMENTS

- Conflicting Standards and Other Requirements: If compliance with two or more standards or A. 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.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Contractor's quality-control personnel.
- Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy B. of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - Seismic-force-resisting system, designated seismic system, or component listed in the Statement 1. of Special Inspections.
 - 2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- C. 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.
- D. 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.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. 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.

1.7 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. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- C. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- D. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- E. 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.

1.8 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.

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- 8. Complete test or inspection data.
- Test and inspection results and an interpretation of test results. 9.
- 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
- Comments or professional opinion on whether tested or inspected Work complies with the 11. Contract Document requirements.
- 12. Name and signature of laboratory inspector.
- 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - Name, address, telephone number, and email address of technical representative making report. 1.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - Summary of installation procedures being followed, whether they comply with requirements and, 4. if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - Statement of whether conditions, products, and installation will affect warranty. 6.
 - Other required items indicated in individual Specification Sections. 7.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - Name, address, telephone number, and email address of factory-authorized service representative 1. making report.
 - 2. Statement that equipment complies with requirements.
 - Results of operational and other tests and a statement of whether observed performance complies 3. with requirements.
 - Statement of whether conditions, products, and installation will affect warranty. 4.
 - 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- Qualifications paragraphs in this article establish the minimum qualification levels required; individual A. Specification Sections specify additional requirements.
- Β. 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.
- Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this C. 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. 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.

- G. 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.
- H. 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.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
 - 1. Provide test specimens representative of proposed products and construction.
 - 2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - 3. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - 4. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
 - 5. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor.
- B. 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.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 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.
- C. 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.

- D. 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 in-situ 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.
- E. 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 013300 "Submittal Procedures."
- F. 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.
- G. 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.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and qualitycontrol 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.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner may engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, 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 quality-control 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.

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QUALITY REQUIREMENTS 014000 - 6

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

3.2 REPAIR AND PROTECTION

- General: On completion of testing, inspection, sample-taking, and similar services, repair damaged A. construction and restore substrates and finishes.
 - Provide materials and comply with installation requirements specified in other Specification 1. 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 017300 "Execution."
- Β. 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.

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END OF SECTION 014000

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- B. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
 - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 3. Indicate methods to be used to avoid trapping water in finished work.
- C. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control measures at each phase of work.
 - 2. Waste-handling procedures.
 - 3. Other dust-control measures.

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- D. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:
 - 1. Methods used to meet the goals and requirements of the Owner.
 - 2. Location of construction devices on the site.
 - 3. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 - 4. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
 - 5. Indicate locations of sensitive areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Accessible Temporary Egress: Comply with applicable provisions in the Illinois Accessibility Code and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flamespread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches (914 by 1524 mm).

2.2 TEMPORARY FACILITIES

A. Field Offices: Owner will provide conditioned interior space for field offices for duration of Project .

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures."

PART 3 - EXECUTION

- 3.1 TEMPORARY FACILITIES, GENERAL
 - A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
- 3.2 INSTALLATION, GENERAL
 - A. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- E. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Comply with the following:
 - 1. Utilize designated area within existing building for temporary field offices.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

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- C. Storage and Staging: Use designated areas of Project site for storage and staging needs.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- D. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- F. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

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- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard and replace stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 - 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

- 1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
- 2. Section 012100 "Allowances" for products selected under an allowance.
- 3. Section 012300 "Alternates" for products selected under an alternate.
- 4. Section 012500 "Substitution Procedures" for requests for substitutions.
- 5. Section 01770 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

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PRODUCT REQUIREMENTS 016000 - 1

- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."
- F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.
- 1.4 QUALITY ASSURANCE
 - A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or poweroperated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 - 3. See individual identification Sections in Divisions 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site for storage of materials and equipment.

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- 2. Store products to allow for inspection and measurement of quantity or counting of units.
- 3. Store materials in a manner that will not endanger Project structure.
- 4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
- 5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 7. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:

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- 1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
- 2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
- 3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience may be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
- 4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
 - a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
- 5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience may be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
- 6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
- 7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-ofdesign product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."
 - 1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
 - 2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation of the Work.
 - 3. Cutting and patching.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for coordination of Owner-furnished products and limits on use of Project site.
 - 2. Section 017700 "Closeout Procedures" for submitting Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Electrical wiring systems.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to

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perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
- b. Membranes and flashings.
- c. Equipment supports.
- d. Piping, ductwork, vessels, and equipment.
- e. Noise- and vibration-control elements and systems.
- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning the Work, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.

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

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

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

3.4 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items onsite and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of

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EXECUTION 017300 - 3

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- 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
- 2. Allow for building movement, including thermal expansion and contraction.
- 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.5 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

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- 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
- 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
- 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
- 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

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

END OF SECTION 017300

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SECTION 017700 - 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 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Section 017900 "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. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

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 Architect'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 017900 "Demonstration and Training."
 - 6. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 8. Complete final cleaning requirements.
 - 9. 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 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 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, 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.

4.

- c. Name of Architect.
- d. Name of Contractor.
- e. Page number.
- Submit list of incomplete items in the following format:
- a. PDF Electronic File: Architect will return annotated file.

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 and CSI Master Format.
- 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 on digital media acceptable to Architect .

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.

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. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. 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.
 - e. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - g. Vacuum and mop concrete.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - i. 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.
 - j. Remove labels that are not permanent.
 - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - 1. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - o. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - p. Clean strainers.
 - q. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit on digital media acceptable to Architect . Enable reviewer comments on draft submittals.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- D. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

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

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

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Architect.
 - 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

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

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- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - Operating characteristics.

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5.

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- 6. Limiting conditions.
- 7. Performance curves.
- 8. Engineering data and tests.
- 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.

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- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.

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OPERATION AND MAINTENANCE DATA

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- 4. Schedule for routine cleaning and maintenance.
- 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "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. Final Submittal:
 - 1) Submit Record Digital Data Files and three set(s) of Record Digital Data File plots.
 - 2) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

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.

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PROJECT RECORD DOCUMENTS 017839 - 1

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- 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. Revisions to routing of piping and conduits.
 - d. Revisions to electrical circuitry.
 - e. Actual equipment locations.
 - f. Duct size and routing.
 - g. Locations of concealed internal utilities.
 - h. Changes made by Change Order or Construction Change Directive.
 - i. Changes made following Architect's written orders.
 - j. Details not on the original Contract Drawings.
 - k. Field records for variable and concealed conditions.
 - l. 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: Annotated PDF electronic file with comment function enabled.
 - 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 with comment function enabled.
 - 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.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

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PROJECT RECORD DOCUMENTS 017839 - 2

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- 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
- 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file orscanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file orscanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION (Not Used)

END OF SECTION 017839

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SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**

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

SUMMARY 1.2

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit three copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - Name of Project. a.
 - b. Name of Architect.
 - Name of Contractor. c.
 - Date of video recording. d.
 - 2. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.4 **OUALITY ASSURANCE**

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- Β. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- Β. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

Program Structure: Develop an instruction program that includes individual training modules for each A. system and for equipment not part of a system, as required by individual Specification Sections.

- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component: 1.
 - Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - System, subsystem, and equipment descriptions. a.
 - Performance and design criteria if Contractor is delegated design responsibility. b.
 - c. Operating standards.
 - d. Regulatory requirements.
 - Equipment function. e.
 - f. Operating characteristics.
 - Limiting conditions. g.
 - Performance curves. h.
 - 2. Documentation: Review the following items in detail:
 - Emergency manuals. a.
 - Systems and equipment operation manuals. b.
 - Systems and equipment maintenance manuals. c.
 - d. Product maintenance manuals.
 - Project Record Documents. e.
 - f. Identification systems.
 - Warranties and bonds. g.
 - h. Maintenance service agreements and similar continuing commitments.
 - Emergencies: Include the following, as applicable:
 - Instructions on meaning of warnings, trouble indications, and error messages. a.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - Sequences for electric or electronic systems. e.
 - Special operating instructions and procedures. f.
 - 4. Operations: Include the following, as applicable:
 - Startup procedures. a.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - Control sequences. e.
 - f. Safety procedures.
 - Instructions on stopping. g.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - 1. Required sequences for electric or electronic systems.
 - Special operating instructions and procedures. m.
 - 5. Adjustments: Include the following:
 - Alignments. a.
 - b. Checking adjustments.
 - Noise and vibration adjustments. c.
 - d. Economy and efficiency adjustments.
 - 6. Troubleshooting: Include the following:
 - Diagnostic instructions. a.
 - Test and inspection procedures. b.
 - Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - List of cleaning agents and methods of cleaning detrimental to product. c.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.

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7.

3.

DEMONSTRATION AND TRAINING 017900 - 2

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- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and remove from Project site . Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode.
 - 1. Submit video recordings on CD-ROM or thumb drive .
 - 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents and CSI Master Format. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents and CSI Master Format:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. Email address.
- B. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 - Film training session(s) in segments not to exceed 15 minutes.

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1.

DEMONSTRATION AND TRAINING 017900 - 3

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- a. Produce segments to present a single significant piece of equipment per segment.
- b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
- c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- C. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
 - 1. Furnish additional portable lighting as required.
- D. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

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SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 **SUMMARY**

- A. Section Includes:
 - Demolition and removal of selected portions of building or structure. 1.
 - 2. Salvage of existing items to be reused or recycled.
- B. **Related Requirements:**
 - Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy 1. requirements, and phasing requirements.
 - 2. Section 017300 "Execution" for cutting and patching procedures.

1.2 DEFINITIONS

- Remove: Detach items from existing construction and dispose of them off-site unless indicated to be A. salvaged or reinstalled.
- Β. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or storage.
- Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare C. for reuse, and reinstall where indicated.
- Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated D. to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- Β. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 INFORMATIONAL SUBMITTALS

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- Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed A. for protecting individuals and property, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - Detailed sequence of selective demolition and removal work, with starting and ending dates for 1. each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - Coordination for shutoff, capping, and continuation of utility services. 3.
 - Coordination of Owner's continuing occupancy of portions of existing building and of Owner's 4. partial occupancy of completed Work.

- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Submit before Work begins.
- Warranties: Documentation indicating that existing warranties are still in effect after completion of D. selective demolition.
- 1.5 CLOSEOUT SUBMITTALS
 - Inventory: Submit a list of items that have been removed and salvaged. А.
- FIELD CONDITIONS 1.6
 - Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct A. selective demolition so Owner's operations will not be disrupted.
 - Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as B. practical.
 - C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
 - D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - Hazardous material remediation will be managed under a separate Contract. 1.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials. Notify Architect upon discovery.
 - 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.
 - Maintain fire-protection facilities in service during selective demolition operations. 1.

1.7 WARRANTY

- Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during A. selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Notify the Architect of any potential warranties impacted by the Work.
- Β. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.8 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video .
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 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. Arrange to shut off utilities with utility companies.
 - 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.

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3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least the minimum number of hours required by the local jurisdiction after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.
 - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.

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- 3. Store items in a secure area until delivery to Owner.
- 4. Transport items to Owner's storage area on-site designated by Owner.
- 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated. OR
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using powerdriven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
 - 1. Remove existing roofing system as required to accommodate new Work and as indicated on the Drawings.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

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

END OF SECTION 024119

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SECTION 233100 - DUCTWORK

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. Duct Materials.
- 2. Flexible ducts.
- 3. Insulated flexible ducts.
- 4. Single wall spiral round ducts.
- 5. Transverse duct connection system.
- 6. Ductwork fabrication.
- 7. Duct cleaning.
- 8. Duct Sealing Mastics.

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM A36 Standard Specification for Carbon Structural Steel.
 - 2. ASTM A90 Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - 3. ASTM A568 Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 - 4. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 5. ASTM A1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 6. ASTM A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 7. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 8. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association:
 - 1. NFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 2. NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
 - 3. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA HVAC Air Duct Leakage Test Manual.
 - 2. SMACNA HVAC Duct Construction Standard Metal and Flexible.
- D. Underwriters Laboratories Inc.:
 - 1. UL 181 Factory-Made Air Ducts and Connectors.

1.4 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.5 SUBMITTALS

- A. See Division 01 for project requirements.
- B. Shop Drawings: Submit duct fabrication drawings, drawn to scale not smaller than 1/8" inch equals 1 foot, on drawing sheets same size as Contract Documents, indicating:
 - 1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
 - 2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust duct systems, indicate classification of materials handled as defined in this section.
 - 3. Fittings.
 - 4. Reinforcing details and spacing.
 - 5. Seam and joint construction details.
 - 6. Penetrations through fire rated and other walls.
 - 7. Terminal unit, coil, and humidifier installations.
 - 8. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
- C. Product Data: Submit data for duct materials, duct liner, and duct connectors.
- D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.6 CLOSEOUT SUBMITTALS

- A. See Division 01 for project requirements.
- B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA HVAC Duct Construction Standards Metal and flexible.
- B. Construct ductwork to NFPA 90A, NFPA 90B, and NFPA 96 standards.

1.8 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.

- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. See Division 01 for project requirements.
- B. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- C. Maintain temperatures during and after installation of duct sealant.

1.11 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Hanger Rod: ASTM A36; steel; threaded both ends, threaded one end, or continuously threaded.

2.2 FLEXIBLE DUCTS

A. Manufacturers: 1. Flex-Master.

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- 2. Therma Flex.
- 3. Techna Flex.
- B. Product Description: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helical-wound spring steel wire.
 - 1. Pressure Rating: 10 inches wg positive and 1.0 inches wg negative.
 - 2. Maximum Velocity: 4000 fpm.
 - 3. Temperature Range: -20 degrees F to 210 degrees F.

2.3 INSULATED FLEXIBLE DUCTS

- A. Manufacturers:
 - 1. Flex-Master.
 - 2. Therma Flex.
 - 3. Techna Flex.
- B. Product Description: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helical wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film.
 - 1. Pressure Rating: 10 inches wg positive and 1.0 inches wg negative.
 - 2. Maximum Velocity: 4000 fpm.
 - 3. Temperature Range: -20 degrees F to 210 degrees F.
 - 4. Thermal Resistance: 4.2 square feet-hour-degree F per BTU.

2.4 SINGLE WALL SPIRAL ROUND DUCTS

- A. Product Description: UL 181, Class 1, round spiral lockseam duct constructed of galvanized steel.
- B. Duct Coating (corrosive or underground applications only): Polyvinyl chloride plastic, 4 mil thick on outside and 2 mil thick on inside. Temperature range: minus 30 degrees F to 200 degrees F.
- C. Construct ductwork and fittings with the following minimum gauges:

Diameter	Gauge	Fitting Gauge
3" to 14"	26	24
15" to 26"	24	22
28" to 36"	22	20
38" to 50"	20	20
52" to 84"	18	16

2.5 TRANSVERSE DUCT CONNECTION SYSTEM

A. Product Description: SMACNA "E" rated, SMACNA "F" rated, or SMACNA "J" rated rigidity class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips.

2.6 SHOP FABRICATED DUCTWORK

- A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.

- C. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- D. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

2.7 DUCT SEALING MASTICS

- A. Manufacturer meeting requirements of SMACNA HVAC Joint Sealing: Refer to SMACNA HVAC Duct Construction Standards, paragraph S1.9.
- B. Sealant: Elastomeric compound, gun or brush grade, maximum 25 flame spread and 50 smoke developed (dry state) compounded specifically for sealing ductwork as recommended by the manufacturer. Generally provide liquid sealant, with or without compatible tape, for low clearance slip joints and heavy, permanently elastic, mastic type where clearances are larger. Oil base caulking and glazing compounds are not acceptable because they do not retain elasticity and bond.
- C. Gaskets in Flanged Joints: Soft neoprene.
- D. Foil tapes shall not be used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 for project requirements.
- B. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

- A. Install and seal ducts with duct sealing mastic in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible.
- B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- C. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 8 inch and smaller.
- D. Install duct hangers and supports in accordance with Section 23 05 29.
- E. Use double nuts and lock washers on threaded rod supports.
- F. Connect flexible ducts to metal ducts with draw bands.
- G. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.
- H. Exposed ductwork: Where ductwork is to be routed exposed, contractor shall de-grease and prime with paint grip finish. Coordinate with architect prior to furnishing duct.

3.3 SCHEDULES

A. Ductwork Material Schedule:

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AIR SYSTEM	MATERIAL
AIR SYSTEM	MATERIAL

General Exhaust Steel

B. Ductwork Pressure Class Schedule:

AIR SYSTEM PRESSURE CLASS

General Exhaust 1 inch wg

END OF SECTION 233100

SECTION 233300 - AIR DUCT 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. Back-draft dampers.
 - 2. Flexible duct connections.

1.3 REFERENCES

- A. Air Movement and Control Association International, Inc.:1. AMCA 500 Test Methods for Louvers, Dampers, and Shutters.
- B. ASTM International:1. ASTM E1 Standard Specification for ASTM Thermometers.
- C. National Fire Protection Association:
 - 1. NFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 2. NFPA 92A Recommended Practice for Smoke-Control Systems.
- D. Sheet Metal and Air Conditioning Contractors:1. SMACNA HVAC Duct Construction Standard Metal and Flexible.
- E. Underwriters Laboratories Inc.:
 - 1. UL 555 Standard for Safety for Fire Dampers.
 - 2. UL 555C Standard for Safety for Ceiling Dampers.
 - 3. UL 555S Standard for Safety for Smoke Dampers.

1.4 SUBMITTALS

- A. See Division 01 for project requirements.
- B. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, and duct test holes.
- C. Product Data: Submit data for shop fabricated assemblies and hardware used.
- D. Product Data: Submit for the following. Include where applicable electrical characteristics and connection requirements.
 - 1. Backdraft dampers.

1.5 CLOSEOUT SUBMITTALS

- A. See Division 01 for project requirements.
- B. Project Record Documents: Record actual locations of access doors and test holes.

1.6 QUALITY ASSURANCE

- A. Dampers tested, rated and labeled in accordance with the latest UL requirements.
- B. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

1.7 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.8 QUALIFICATIONS

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

1.9 DELIVERY, STORAGE, AND HANDLING

- A. See Division 01 for project requirements.
- B. Protect dampers from damage to operating linkages and blades.
- C. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
- D. Storage: Store materials in a dry area indoor, protected from damage.

E. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 COORDINATION

- A. See Division 01 for project requirements.
- B. Coordinate Work where appropriate with building control Work.

1.12 EXTRA MATERIALS

A. See Division 01 for project requirements.

PART 2 - PRODUCTS

2.1 BACK-DRAFT DAMPERS

- A. Manufacturers:
 - 1. Greenheck.
 - 2. Cook.
 - 3. Ruskin.
 - 4. Dowco Products.
 - 5. Carnes.
 - 6. Vent Products.
 - 7. Pottorff.
- B. Product Description: Multi-Blade, back-draft dampers: Parallel-action, gravity-balanced, Galvanized 16 gage extruded aluminum. Blades, maximum 6 inch width, center pivoted, with felt or flexible vinyl sealed edges. Blades linked together in rattle-free manner with 90-degree stop, steel ball bearings, and plated steel pivot pin. Furnish dampers with adjustment device to permit setting for varying differential static pressure.

2.2 DUCT TEST HOLES

A. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 for project requirements.
- B. Verify ducts and equipment installation are ready for accessories.
- C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION

- A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.
- B. Install back-draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated on Drawings.
- C. Install permanent duct test holes where indicated on Drawings and required for testing and balancing purposes.

3.3 DEMONSTRATION

- A. See Division 01 for project requirements.
- B. Demonstrate re-setting of fire dampers to Owner's representative.

END OF SECTION 233300
SECTION 233400 - HVAC FANS

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. Ceiling fans.

1.3 REFERENCES

- A. American Bearing Manufacturers Association:
 - 1. ABMA 9 Load Ratings and Fatigue Life for Ball Bearings.
 - 2. ABMA 11 Load Ratings and Fatigue Life for Roller Bearings.
- B. Air Movement and Control Association International, Inc.:
 - 1. AMCA 99 Standards Handbook.
 - 2. AMCA 204 Balance Quality and Vibration Levels for Fans.
 - 3. AMCA 210 Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
 - 4. AMCA 300 Reverberant Room Method for Sound Testing of Fans.
 - 5. AMCA 301 Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- C. National Electrical Manufacturers Association:
 - 1. NEMA MG 1 Motors and Generators.
 - 2. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. Underwriters Laboratories Inc.:1. UL 705 Power Ventilators.

1.4 SUBMITTALS

- A. See Division 01 for project requirements.
- B. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
- C. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Submit fan manufacturers instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. See Division 01 for project requirements.

B. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.6 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- D. Balance Quality: Conform to AMCA 204.
- E. Energy Recovery Unit Wheel Energy Transfer Rating: Meet ARI 1060.

1.7 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.8 QUALIFICATIONS

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

- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- 1.9 DELIVERY, STORAGE, AND HANDLING
 - A. See Division 01 for project requirements.
 - B. Protect motors, shafts, and bearings from weather and construction dust.
- 1.10 FIELD MEASUREMENTS
 - A. Verify field measurements prior to fabrication.

1.11 WARRANTY

- A. See Division 01 for project requirements.
- B. Furnish manufacturer's standard, but not less than one year, warranty for fans.
- 1.12 MAINTENANCE SERVICE
 - A. See Division 01 for project requirements.

1.13 EXTRA MATERIALS

- A. See Division 01 for project requirements.
- B. Furnish two sets of belts for each fan.

PART 2 - PRODUCTS

2.1 CEILING FANS

A. Manufacturers:

- 1. Basis of Design: Greenheck Corp. Model 'SP'.
- 2. Loren Cook Company.
- 3. Carnes.
- 4. Broan.
- 5. Nutone.
- 6. ILG.
- 7. Soler & Palau.
- 8. Acme.
- B. Centrifugal Fan Unit: Direct driven with galvanized steel housing, resilient mounted motor, gravity backdraft damper in discharge opening, integral outlet duct collar.
- C. Disconnect Switch: Cord and plug in housing for thermal overload protected motor.
- D. Grille: Molded white plastic.
- E. Wheel: Centrifugal forward curved type constructed of injection molded or polypropylene resin.
- F. Motor: Open drip proof type with permanently lubricated sealed bearings and thermal overload protection.

- G. Accessories:
 - 1. Roof cap with roof curb.
 - 2. Rubber-in-shear vibration isolator.
 - 3. Fan speed controller.
 - 4. Time delay relay.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 for project requirements.
- B. Verify roof curbs are installed and dimensions are as instructed by manufacturer.

3.2 INSTALLATION

- A. Secure roof and wall fans with aluminum or stainless steel lag screws to roof curb or structure.
- B. Suspended Fans: Install flexible connections specified in Section 23 33 00 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- C. Install backdraft dampers on inlet to roof and wall exhaust fans.
- D. Provide backdraft dampers on outlet from cabinet and ceiling fans and as indicated on Drawings.
- E. Install backdraft dampers on discharge of exhaust fans and as indicated on Drawings.
- F. Provide sheaves required for final air balance.

3.3 CLEANING

- A. See Division 01 for project requirements.
- B. Vacuum clean coils and inside of fan cabinet.

3.4 DEMONSTRATION

- A. See Division 01 for project requirements.
- B. Demonstrate fan operation and maintenance procedures.

3.5 PROTECTION OF FINISHED WORK

- A. See Division 01 for project requirements.
- B. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 223400

SECTION 238200 - TERMINAL HEATING UNITS

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. Electric ceiling heaters.

1.3 SUBMITTALS

A. Product Data: Submit schedules for equipment and radiation enclosures indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output of equipment. Submit coil and frame configurations, and rough-in dimensions.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit operating instructions, maintenance and repair data, and parts lists.

1.5 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.

- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.6 WARRANTY

A. Furnish manufacturer's one year warranty.

PART 2 - PRODUCTS

2.1 ELECTRIC CEILING HEATERS

- A. Manufacturers:
 - 1. Markel.
 - 2. Q-Mark.
 - 3. Berko.
 - 4. Redd-i.
- B. Contractor shall supply and install heavy duty ceiling-mounted forced air electric heater(s) of the wattage, voltage and phase as indicated on the plans. The heater shall so be designed to provide an even distribution of heated air to the space to be heated by drawing return air in the perifery of the heater, across and through the element and be discharged from the center section of the heater by means of an electric motor and axial flow fan blade.
- C. Heaters shall be recessed type and mounted flush with the finished ceiling. The return grille assembly shall be constructed of a one piece heavy gauge steel with 1/4" sq. slots for return air and concentric rings for uniform air discharge. Grille assembly shall be attached to chassis by tamper-resistant (allen head) machine screws. All parts of enclosure shall be heavy gauge steel, zinc coated both sides and finished in neutral of white colored baked enamel.
- D. Enclosure shall be constructed of 1/16" x 3/8" rounded edge horizontal steel louvers which shall be spaced for maximum opening of 5/16". Louvers shall be welded at every intersection to evenly spaced to 1/8" diameter vertical members.
- E. Motor shall be permanent lubricated, unit bearing, totally enclosed shaded pole type with impedance protection. Motors shall operate at no more than 1300 RPM and shall be same voltage as the heater.
- F. Heaters shall have a rating of 425 CFM at 710 FPM with a maximum temperature rise of 44°F and 63.9 DB RE 1012 watt.
- G. Element assemblies shall consist of two or three corrosion resistant steel sheathed type elements mechanically bonded to common corrosion resistant steel fins. Each sheathed element shall consist of helically coiled nickel chromium alloy resistant wire completely embedded in and surrounded by magnesium oxide, enclosed and wedged into corrosion resistant steel sheaths. Elements shall have 2" cold conductor pins extending into sheath and shall have a density of no more than 60 watts per inch.
- H. Heaters shall be equipped with a "zero voltage reset" thermal overload which disconnects elements and motor in the event normal operating temperatures are exceeded. For safety, if opened due to abnormal temperatures, thermal overload shall remain open until manually reset by turning heater off for five minutes. Automatic reset thermal overloads which allow the element to continue to cycle under abnormal conditions will not be accepted.
- I. Heaters shall be Underwriter's Laboratories listed. Heaters shall conform to Underwriters' Standard 1025.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify wall construction and ductwork are ready for installation.
- B. Verify concealed blocking and supports are in place and connections are correctly located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install equipment exposed to finished areas after walls and ceiling are finished and painted. Avoid damage.
- C. Protection: Provide finished cabinet units to protective covers during balance of construction.
- D. Use temporary filters for equipment start-up. After owner acceptance install final filters.
- E. Install unit heaters from building structure. Support independently from piping.
- F. Install convectors and cabinet unit heaters as indicated on Drawings. Coordinate to assure correct recess size for recessed units.
- G. Install electric heating equipment including devices furnished by manufacturer but not factory-mounted, including remote thermostats with guards.
- H. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer
- I. Install new filters.

END OF SECTION 238200

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

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. Grounding electrodes and conductors.
- 2. Equipment grounding conductors.
- 3. Bonding methods and materials.
- 4. Conduit and equipment supports.
- 5. Anchors and fasteners.
- 6. Nameplates and labels.
- 7. Wire markers.
- 8. Raceway markers.
- 9. Underground warning tape.
- 10. Sealing and fireproofing of sleeves and openings between conduits, wireways, boxes and troughs.

1.3 REFERENCES

- A. NECA (National Electrical Contractors Association) Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.4 SYSTEM DESCRIPTION

- A. Anchor and fasten electrical products to building elements and finishes as follows:
 - 1. Concrete Structural Elements: Provide precast inserts, expansion anchors, powder actuated anchors and preset inserts.
 - 2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
 - 3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
 - 5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
 - 6. Sheet Metal: Provide sheet metal screws.
 - 7. Wood Elements: Provide wood screws.
- B. Identify electrical components as follows:
 - 1. Nameplate for each electrical distribution and control equipment enclosure.
 - 2. Wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes and each load connection.

1.5 DESIGN REQUIREMENTS

A. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Provide updated version of 1/8" = 1'-0" scale coordination shop drawings indicating actual locations of items shown on the original drawings. Drawings shall include all revisions incorporated throughout th project. Drawings shall include updated plans views, circuiting, risers, panel schedules and routing of all feeders. Plans shall be submitted in PDF and created utilizing software packages such as AutoCAD or Adobe. Record documents produced utilizing hand markups will not be acceptable.
- B. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- 1.8 REGULATORY REQUIREMENTS
 - A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
 - B. Conform to the 2015 International Building Code (IBC).
 - C. Conform to the 2015 International Existing Building Code (IEBC).
 - D. Conform to the 2015 International Fuel Gas Code (IFGC).
 - E. Conform to the 2015 International Property Maintenance Code (IPMC).
 - F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
 - G. Conform to the 2018 International Energy Conservation Code (IECC).
 - H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
 - I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
 - J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
 - K. Conform to the 2015 International Mechanical Code (IMC).
 - L. Conform to the 2015 ICC Electrical Code.
 - M. Conform to 2014 NFPA 70, National Electrical Code.
 - N. Conform to 2013 NFPA 72, National Fire Alarm Code.
 - O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 MECHANICAL CONNECTORS

A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.2 ANCHORS AND FASTENERS

- A. Anchors and Fasteners: Compatible with application.
- B. Materials and Finishes: Corrosion resistant.

2.3 FORMED STEEL CHANNEL

- A. Manufacturers:
 - 1. Cooper B-Line.
 - 2. Unistrut.
 - 3. Superstrut.
- B. Description: Galvanized steel.

2.4 SPRING STEEL CLIPS

- A. Manufacturers:
 - 1. Cooper B-Line.
 - 2. Erico, Inc.
 - 3. Thomas & Betts Corp.

2.5 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Letter Size:
 - 1. 1/4" letters for identifying individual equipment and loads.
- C. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

2.6 WIRE MARKERS

- A. Description: Cloth tape, split sleeve, or tubing type wire markers.
- B. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
 - 2. Control Circuits: Control wire number as indicated on shop drawings, schematic and interconnection diagrams.

2.7 SEALING AND FIREPROOFING

- A. Fire and Smoke Rated Surfaces:
 - 1. Manufacturers:
 - a. 3M CP 25N/S or CP25S/L caulk.
 - b. 3M FS 195 wrap or strip with restricting collar.
 - c. 3M CS 195 composite sheet.

- d. 3M Fire Barrier Moldable Putty Pads MPP+
- e. Pipe Shield, Inc. series F fire barrier kits.
- f. Proset Systems fire rated floor and wall penetrations.
- g. Insta-Foam Products Insta-Fire Seal Firestop Foam.
- h. Dow Corning Fire Stop System.
- i. Substitutions: Under provisions of Section 01 60 00.

B. General:

- 1. Furnish UL listed products or products tested by independent testing laboratory.
- 2. Select products with rating not less than rating of wall or floor being penetrated.
- C. Non-Rated Surfaces:
 - 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
 - 2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.
 - 3. For interior wall or floor openings, furnish one of the following to effect seal:
 - a. Tremco Dymonic.
 - b. Sika Corp. Sikaflex la.
 - c. Sonneborn Sonolastic NPI.
 - d. Mameco Vilken 116 urethane caulk
 - e. ATS acoustical Putty Pads for Junction Boxes
 - f. Substitutions: Under provisions of Section 01 60 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify final backfill and compaction has been completed before driving rod electrodes.
- B. Verify abandoned wiring and equipment serve only abandoned facilities.

3.2 INSTALLATION

- A. Grounding and Bonding Installation:
 - 1. Install bonding meeting Regulatory Requirements.
 - 2. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- B. Fasteners
 - 1. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
 - 2. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
 - 3. Do not use spring steel clips and clamps.
 - 4. Obtain permission from Architect/Engineer before using powder-actuated anchors.
 - 5. Obtain permission from Architect/Engineer before drilling or cutting structural members.
- C. Supports:
 - 1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.

- 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
- 4. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- D. Identification Components:
 - 1. Degrease and clean surfaces to receive nameplates and labels.
 - 2. Install nameplate and label parallel to equipment lines.
 - 3. Secure nameplate to equipment front using screws, rivets, or adhesive.
 - 4. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
 - 5. Identify underground conduits using one underground warning tape for each trench at 4 inches below finished grade.
- E. Coordination With Other Trades:
 - 1. Contractor shall coordinate the installation of their work with all other contractors of the project.
 - 2. Install all work provided by this contract to maintain installation, maintenance, operation and working clearances of all equipment, including equipment provided by other trades.
 - 3. Install all work provided by this contract to maintain installation, maintenance, operation and working clearances of all existing equipment, including existing equipment of other trades.
- F. Box Painting: Identify fire alarm system junction, pull and backboxes with paint, red in color.
- G. Panelboard Schedules:
 - 1. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
 - 2. Provide typed circuit directory for each existing panelboard modified under contract. New directory shall include all existing loads previously documented in existing directory and new loads. Identify any breakers in existing panels that do not have load conductors terminated at their lugs and mark as spare. Leave spare breakers in the off position.
 - 3. All panelboard schedules shall list the date created and the size and location (source panel and room) of the upstream over current protection for the feeder serving the panel.

3.3 SEALING AND FIREPROOFING

A. Fire Rated Surface:

- 1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
 - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Pack void with backing material.
 - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
- 2. Where conduit or other type of electrical raceway, bus or enclosure penetrates fire rated surface, install firestopping product in accordance with manufacturer's published instructions.
- 3. Utilize suitable and listed materials and methods to maintain fire and smoke resistive rating of all partitions. Penetration and boxes shall be installed and fire sealed to maintain listed partition ratings.
- B. Non-Rated Surfaces:
 - 1. Seal opening through non-fire rated wall, floor, ceiling, and roof opening as follows:
 - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Install type of firestopping material recommended by manufacturer.

- 2. Install escutcheons floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
- 3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.
- 4. Interior partitions: Seal pipe penetrations at computer rooms, telecommunication rooms and data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.
- 5. In acoustical partitions, install pads and sealant to maintain acoustical ratings.
- C. Sleeves:
 - 1. Sleeves shall be provided for all cable penetrations though partitions for any and all systems. Where sleeve size is not specified on the plans, sleeves shall be provided such that no sleeve is filled beyond 40%. Seal sleeve after completion of cable pulls. Minimum size sleeve shall be 3/4" EMT.

3.4 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.

END OF SECTION 260500

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

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: Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled; removal of designated construction; dismantling, cutting and alterations for completion of the Work.
 - 1. Disposal of materials.
 - 2. Storage of removed materials.
 - 3. Identification of utilities.
 - 4. Salvaged items.
 - 5. Protection of items to remain as indicated on Drawings.
 - 6. Relocate existing equipment to accommodate construction.

1.3 SCHEDULING

- A. Schedule work to coincide with renovation schedule.
- B. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

1.4 COORDINATION

- A. Conduct demolition to minimize interference with adjacent building areas.
- B. Coordinate demolition work with general contractor and other trades.
- C. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- D. Shut-down Periods:
 - 1. Arrange timing of shut-down periods of in service panels with Owner. Do not shut down any utility without prior written approval.
 - 2. Keep shut-down period to minimum or use intermittent period as directed by Owner.
 - 3. Maintain life-safety systems in full operation in occupied facilities, or provide notice minimum one week in advance.
 - 4. Provide temporary power and wiring as required to maintain life-safety and other systems in operation in areas of building not affected by scope of work.
 - 5. Identify salvage items in cooperation with Owner.

1.5 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).

- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.
- PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
- C. Verify termination points for demolished services.

3.2 PREPARATION

- A. Erect, and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of the public, Owner, Contractor's employees, and existing improvements to remain.
- B. Temporary egress signage and emergency lighting

3.3 DEMOLITION

- A. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Architect/Engineer before disturbing existing installation.
- B. Remove exposed abandoned conduit including abandoned conduit above accessible ceiling finishes. Cut embedded conduit flush with walls, floors, and patch surfaces.
- C. Remove conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- D. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

- E. Reconnect equipment being disturbed by renovation work and required for continue service to previous source if remaining or nearest available panel.
- F. Disconnect or shut off service to areas where electrical work is to be removed. Remove electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not part of final project.
- G. Install temporary wiring and connections to maintain existing systems in service during construction.
- H. Perform work on energized equipment or circuits with experienced and trained personnel utilizing appropriate PPE (Personal Protective Equipment).
- I. Remove, relocate, and extend existing installations to accommodate new construction.
- J. Repair adjacent construction and finishes damaged during demolition and extension work.
- K. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finish. Cut embedded support elements flush with walls and floors.
- L. Clean and repair existing equipment to remain or to be reinstalled.
- M. Protect and retain power to existing active equipment remaining.
- N. Where demolition of a device or electrical equipment is called out for, remove equipment, associated wiring, accessible conduit and auxiliary devices unless otherwise amended by drawing notes or other specification sections.
- O. Fluorescent Lamps and Ballasts shall be removed from demolished fixtures and disposed of in compliance with State and Federal EPA standards. Lamps shall be collected and compacted on site utilizing a crushing machine that contains all lamp waste. Lamps shall be recycled, provide Certificate of Recycling proving lamps have been recycled. Ballasts shall be recycled, provide Certificate of Recycling proving ballasts have been recycled.

3.4 EXISTING PANELBOARDS

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers.
- B. Tag unused circuits as spare. Leave breakers in off position.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where any circuits have been modified or rewired.

3.5 SALVAGE ITEMS

- A. Remove and protect items indicated on Drawings to be salvaged and turn over to Owner.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed to location as directed by Owner.

3.6 REUSABLE ELECTRICAL EQUIPMENT

- A. Carefully remove equipment, materials, or fixtures which are to be reused.
- B. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation of any systems included in the project.
- C. Relocate existing lighting fixtures as indicated on Drawings. Clean fixtures and re-lamp. Test fixture to see if it is in good working condition before installation at new location.

3.7 CLEANING

- A. Remove demolished materials as work progresses. Legally dispose.
- B. Keep workplace neat.
- 3.8 PROTECTION OF FINISHED WORK
 - A. Do not permit traffic over unprotected floor surface.
 - B. Coordinate floor protection with General Contractor or Construction Manager.

END OF SECTION 260505

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Building Wire and Cable.
- 2. Wiring Connectors and Connections.

1.3 REFERENCES

- A. NECA Standard of Installation (National Electrical Contractors Association).
- B. NETA ATS (International Electrical Testing Association) Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- C. NFPA 70 National Electrical Code.

1.4 SUBMITTALS

- A. See Division 01 for project requirements.
- B. Product Data: Submit for building wire and cable type.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and circuits.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten years experience.

1.7 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).

- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as indicated.
- B. Conductor sizes are based on copper.
- C. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 ft of length shown.

1.9 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 - 1. Allied Wire & Cable.
 - 2. Encore Wire.
 - 3. Cerro Wire and Cable.
 - 4. Southwire.
 - 5. Republic Wire
- B. Description: Single conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation: NFPA 70, Type THHN/THWN-2 or XHHW-2 for service-entrance conductors, feeders and branch circuits.

2.2 WIRING CONNECTORS

- A. Provide connectors specifically designed for the conductor sizes utilized.
- B. When splicing or connecting dissimilar metal conductors (copper to aluminum) use only UL listed, labeled and identified materials and methods.
- C. All terminals and splicing shall be in accordance with NEC Section 110-14.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that interior of building has been protected from weather.
- C. Verify that mechanical work likely to damage wire and cable has been completed.
- D. Verify that raceway installation is complete and supported.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire and cable.

3.3 INSTALLATION

- A. Route wire and cable as required to meet Project Conditions.
- B. Install cable in accordance with the NECA "Standard of Installation."
- C. Use solid conductor for feeders and branch circuits 10 AWG and smaller.
- D. Use stranded conductors for control circuits.
- E. Use conductor not smaller than 12 AWG for power and lighting circuits.
- F. Use conductor not smaller than 18 AWG for control circuits.
- G. Branch circuit wiring for 20 Amp circuits shall be adjusted for voltage drop:

1.	208/12 a. b. c.	20V: 0-75 75'-150' 150'-225'	- -	#12 AWG Minimum #10 AWG Minimum #8 AWG Minimum
2.	480/27 a. b. c.	77V: 0-100' 100'-200' 200'-300'	- - -	#12AWG Minimum #10AWG Minimum #8AWG Minimum

- H. Pull all conductors into raceway at same time.
- I. Use suitable wire pulling lubricant for building wire 4 AWG and larger unless pre-lubricated.

- J. Protect exposed cable from damage.
- K. Support cables above accessible ceiling, using bridal rings. Do not rest cable on ceiling panels.
- L. Use UL listed and labeled cable fittings and connectors.
- M. Neatly train and lace wiring inside boxes, equipment, switchboards and panelboard enclosures.
- N. Clean conductor surfaces before installing lugs and connectors.
- O. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- P. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- Q. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG.
- R. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- S. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.
- T. All terminations, splices and taps shall be torqued in accordance with manufacturer's recommendations. In the absence of connector or equipment manufacturer's recommended torque values, use UL Standard 486A-B or NFPA70- Informative Annex I.

3.4 FIELD QUALITY CONTROL

A. Inspect and test prior to starting system.

END OF SECTION 260519

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

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. Conduit and equipment supports.
 - 2. Anchors and fasteners.
 - 3. Roof Mounted Conduit Supports

1.3 REFERENCES

- A. NECA National Electrical Contractors Association.
- B. NFPA 70 National Electrical Code.
- 1.4 REGULATORY REQUIREMENTS
 - A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
 - B. Conform to the 2015 International Building Code (IBC).
 - C. Conform to the 2015 International Existing Building Code (IEBC).
 - D. Conform to the 2015 International Fuel Gas Code (IFGC).
 - E. Conform to the 2015 International Property Maintenance Code (IPMC).
 - F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
 - G. Conform to the 2018 International Energy Conservation Code (IECC).
 - H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
 - I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
 - J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
 - K. Conform to the 2015 International Mechanical Code (IMC).
 - L. Conform to the 2015 ICC Electrical Code.
 - M. Conform to 2014 NFPA 70, National Electrical Code.
 - N. Conform to 2013 NFPA 72, National Fire Alarm Code.
 - O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide adequate corrosion resistance.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- C. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Use precast insert system, expansion anchors and preset inserts.
 - 2. Steel Structural Elements: Use beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
 - 3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
 - 5. Solid Masonry Walls: Use expansion anchors and preset inserts.
 - 6. Sheet Metal: Use sheet metal screws.
 - 7. Wood Elements: Use wood screws.

2.2 STEEL CHANNEL

- A. Manufacturer:
 - 1. Cooper B-Line.
 - 2. Unistrut.
 - 3. Superstrut.
 - 4. Substitutions: Under provisions of Section 01 60 00.
- B. Description: Galvanized steel, channel, size accordingly to accommodate load served.

2.3 ROOF MOUNTED PIPING AND CONDUIT SUPPORTS

- A. Acceptable Manufacturer: Dura-Blok,
- B. 5" tall, UV resistant rubber block with bolted strut channel for conduit attachment. .
- C. Base shall be made from 100% recycled rubber, with drainage channel through center of block. Where elevation above 5" is required, utilize additional strut material to construct rack to height of required elevation.
- D. Provide 1/2" thick UV resistance rubber pad under block extending a minimum 1" beyond block in all directions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use spring steel clips and clamps.
- E. Do not use powder-actuated anchors.

- F. Obtain permission from Architect/Engineer before drilling or cutting structural members.
- G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts. Paint exposed ends of steel channels to protect from corrosion. Provide plastic end caps by steel channel manufacture for all exposed ends below 8'.
- H. Install surface-mounted cabinets with minimum of four anchors.
- I. Contractor shall coordinate the installation of their work with all other contractors of the project.
- J. Install all hangers and supports provided by this contract to maintain installation, maintenance, operation and working clearances of all equipment, including equipment provided by other trades.
- K. Install all hangers and supports provided by this contract to maintain installation, maintenance, operation and working clearances of all existing equipment, including existing equipment of other trades.
- L. Do not suspend equipment from roof decking.

END OF SECTION 260529

SECTION 260533 - RACEWAY AND BOXES

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. Conduit and Tubing.
 - 2. Surface Raceways.
 - 3. Wireways.
 - 4. Outlet Boxes.
 - 5. Pull and Junction Boxes.
 - 6. Wall and ceiling outlet boxes.

1.3 REFERENCES

- A. ANSI C80.1 Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 Electrical Metallic Tubing, Zinc Coated.
- C. ANSI C80.5 Rigid Aluminum Conduit.
- D. NECA (National Electrical Contractor's Association) "Standard of Installation"
- E. NEMA FB 1 (National Electrical Manufacturers Association) Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- F. NEMA OS 1 (National Electrical Manufacturers Association) Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- G. NEMA OS 2 (National Electrical Manufacturers Association) Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- H. NEMA RN 1 (National Electrical Manufacturers Association) Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- I. NEMA TC 2 (National Electrical Manufacturers Association) Electrical Polyvinyl Chloride (PVC) Tbing and Conduit.
- J. NEMA TC 3 (National Electrical Manufacturers Association) PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- K. NEMA WD 6 Wiring Device Configurations.
- L. NEMA 250 (National Electrical Manufacturers Association) Enclosures for Electrical Equipment (1000 Volts Maximum).

1.4 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground Outside Foundation Wall: Provide rigid steel conduit, intermediate metal conduit, plastic coated rigid steel conduit, schedule 80 PVC. Where approved by all bodies having jurisdiction and indicated on drawings, provide nonmetallic conduit with steel elbows. Provide cast boxes.
- C. In or Under Slab on Grade: Provide rigid steel conduit, intermediate metal conduit, plastic coated rigid steel conduit, schedule 40 PVC. Where approved by all bodies having jurisdiction and indicated on drawings, provide nonmetallic conduit with steel elbows. Provide cast boxes.
- D. Outdoor Locations, Above Grade: Provide rigid steel and aluminum conduit. Provide cast metal outlet, pull, and junction boxes.
- E. In Slab Above Grade: Provide rigid steel conduit or intermediate metal conduit or where approved by all bodies having jurisdiction; provide thickwall nonmetallic conduit with steel elbows. Provide cast or sheet metal boxes.
- F. Wet and Damp Locations: Provide rigid steel and aluminum conduit. Provide cast metal, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- G. Concealed Dry Locations: Provide rigid steel and aluminum conduit, intermediate metal conduit or electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Conduits 2" and below may be electrical metallic tubing. Conduits over 2" shall be rigid steel and aluminum conduit, intermediate metal conduit, unless indicated otherwise on drawings.
- H. Exposed Dry Locations (unfinished areas): Provide rigid steel and aluminum conduit or intermediate metal conduit where subject to damage, otherwise provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Conduits 2" and below may be electrical metallic tubing. Conduits over 2" shall be rigid steel and aluminum conduit, intermediate metal conduit, unless indicated otherwise on drawings.
- I. Exposed Dry Locations (Finished areas): Provide surface mounted raceways systems.
- J. Sleeves: Provided for all cable penetrations though partitions for any and all systems. Where sleeve size is not specified on the plans, sleeves shall be provided such that no sleeve is filled beyond 40%. Seal sleeve after completion of cable pulls. Minimum size sleeve shall be 3/4" EMT.

1.5 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.

- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.6 DESIGN REQUIREMENTS

- A. Minimum raceway size for concealed or exposed locations withing building: 3/4 inch. 1/2 inch conduit will be acceptable for end of the line (no more than one circuit). Branch conduits to receptacles or lighting fixtures.
- B. Install all conduits concealed unless specifically called out on the drawings to be exposed. Where installing new raceways on existing walls, raceways are to be complete surface metallic raceway system.
- C. Ceiling mounted devices shall be installed on a recessed metallic backbox. Provide concealed raceway system over gypsum ceilings to nearest accessible ceiling. Provide tile bridge to support backbox compatible with specified ceiling system.
- D. Minimum raceway size in or below slab on grade: 1 inch.
- E. Conduit Size: ANSI/NFPA 70.

1.7 SUBMITTALS

- A. Product Data: Submit for surface raceway system. Provide dimensions, knockout sizes and locations, materials, fabrication details, finishes, and accessories.
- B. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.8 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 - 1. Record actual routing of conduits larger than 2 inch trade size.
 - 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Accept conduit on site. Inspect for damage.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

1.10 QUALITY ASSURANCE

A. Perform work in accordance with NECA Standard of Installation.

1.11 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years documented experience.

1.12 COORDINATION

- A. Coordinate installation of outlet boxes for equipment connected under other sections.
- B. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- C. Contractor shall coordinate the installation of their work with all other contractors of the project.
- D. Install all raceways and boxes provided by this contract to maintain installation, maintenance, operation and working clearances of all equipment, including equipment provided by other trades.
- E. Install all raceways and boxes provided by this contract to maintain installation, maintenance, operation and working clearances of all existing equipment, including existing equipment of other trades.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Manufacturers:
 - 1. Allied Tube and Conduit Corp.
 - 2. Republic Conduit.
 - 3. Wheatland Tube Company.
 - 4. Substitutions: Under provisions of Section 01 60 00.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Rigid Aluminum Conduit: ANSI C80.5.
- D. Intermediate Metal Conduit (IMC): Rigid steel.
- E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 FLEXIBLE METAL CONDUIT

A. Manufacturers:

- 1. Alflex.
- 2. Anamet Electrical.
- 3. Electri-Flex Co.
- 4. Substitutions: Under provisions of Section 01 60 00.
- B. Product Description: Interlocked steel or aluminum construction.
- C. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. Alflex.
 - 2. Anamet Electrical.
 - 3. Electri-Flex Co.
 - 4. Substitutions: Under provisions of Section 01 60 00.
- B. Product Description: Interlocked steel or aluminum construction with PVC jacket.
- C. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
 - 1. Allied Tube and Conduit Corp.
 - 2. Republic Conduit.
 - 3. Wheatland Tube Company.
 - 4. Substitutions: Under provisions of Section 01 60 00.
- B. Product Description: ANSI C80.3; galvanized tubing.
- C. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type.
- D. Provide color coded conduit for sizes 1/2" thru 4". Finish shall be factory applied by the manufacture. Conduit shall be available in 8 color options.
 - 1. Yellow
 - 2. Blue
 - 3. Red
 - 4. Green
 - 5. Purple
 - 6. Orange
 - 7. White
 - 8. Black
- E. Provide "red" conduit for fire alarm conductors/cables.

2.5 NONMETALLIC CONDUIT

- A. Manufacturers:
 - 1. Cantex, Inc.
 - 2. Carlon Electrical Products.
 - 3. PW Pipe.
 - 4. Substitutions: Under provisions of Section 01 60 00.
- B. Product Description: NEMA TC 2; Schedule 40 or outdoors provide Schedule 80 PVC.

Project 2022052 Newman Architecture C. Fittings and Conduit Bodies: NEMA TC 3.

2.6 SURFACE METALLIC RACEWAYS

- A. Manufacturers:
 - 1. Wiremold, V700 Series.
 - 2. Wiremold, V2400 Series
 - 3. Substitutions: Under provisions of the General Requirements of this specification.
- B. Description: One piece surface steel raceway.

C. Size:

- 1. V700 3/4" wide x 21/32" deep by length as required.
- 2. V2400 1-29/32" wide x 7/8 deep by length as required.
- D. Finish: To be selected from manufactures standard finish offering..
- E. Fittings, Device Brackets and Faceplates: Furnish with manufacturer's standard accessories. Accessories include but are not limited to, transition fittings offsets, cover, end caps, dividers and mounting hardware. Where surface mount raceway transition to above ceilings, provide transition fitting immediately below ceiling cover opening through ceiling materials.

2.7 SURFACE MULTI CHANNEL METALLIC RACEWAYS

- A. Manufacturers:
 - 1. Wiremold, 4000 Series.
 - 2. Substitutions: Under provisions of the General Requirements of this specification.
- B. Description: Two-piece multichannel steel raceway system with two compartments.
- C. Size: 4 3/4" wide x 1 3/4" deep by length as required.
- D. Finish: To be selected from manufactures standard finish offering..
- E. Device Brackets and Faceplates: Faceplates to match wiring device finish, provide manufacture standard finish selection options.
- F. Fittings: Furnish with manufacturer's standard accessories. Accessories include but are not limited to, transition fittings offsets, cover, end caps, dividers and mounting hardware. Where surface mount raceway transition to above ceilings, provide transition fitting immediately below ceiling cover opening through ceiling materials.

2.8 WIREWAY

- A. Manufacturers:
 - 1. Cooper B-Line.
 - 2. Hoffman.
 - 3. Square D Company.
 - 4. Substitutions: Industry Standard Equivalent.
- B. Product Description: General purpose or Oiltight and dusttight or Raintight type wireway.
- C. Knockouts: Manufacturer's standard.
- D. Size: 4 x 4 inch unless indicated larger on drawings. Provide length as required.

- E. Cover: Screw cover with full gasketing.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.9 OUTLET BOXES

- A. Manufacturers: Minimum depth 2 1/8"
 - 1. Appleton Electric.
 - 2. OZ Gedney.
 - 3. Raco.
 - 4. Red Dot.
 - 5. Thomas & Betts.
 - 6. Substitutions: Industry Standard Equivalent.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 3/4 inch male fixture studs where required.
 - 2. Concrete Ceiling Boxes: Concrete type.
- C. Cast Boxes: NEMA FB 1, Type FD, aluminum or cast feralloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.
- D. Wall Plates for Finished Areas: As specified in Section 26 27 26.
- E. Wall Plates for Unfinished Areas: Furnish gasketed cover.
- F. Outlet boxes containing fire alarm cabling and devices shall be "red" in color.

2.10 BACKBOXES - A/V

- A. Manufacturers: Minimum depth 3"
 - 1. Hubbell. Basis of Design, HBL 260
 - 2. Thomas and Betts. 4 Square
 - 3. Raco. 260
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Audio Visual Back Boxes: Concentric knock outs with combinations of 3/4", 1", 1 1/4", 1 1/2", 2" are required. Minimum (2) 2" knock outs are required.
- C. Locations: As detailed on division 27 drawings.

2.11 PULL AND JUNCTION BOXES

- A. Manufacturers:
 - 1. Appleton Electric.
 - 2. Hoffman.
 - 3. OZ Gedney.
 - 4. Raco.
 - 5. Thomas & Betts.
 - 6. Substitutions: Industry Standard Equivalent.
- B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- C. Surface Mounted Cast Metal Box: NEMA 250, Type 4 or 4X; flat-flanged, surface mounted junction box:

- 1. Material: Galvanized cast iron.
- 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- D. In-Ground Cast Metal Box: NEMA 250, Type 6, outside or inside flanged, recessed cover box for flush mounting:
 - 1. Material: Galvanized cast iron.
 - 2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.
 - 3. Cover Legend: "ELECTRIC".
- E. Fiberglass Concrete composite Handholes: Die-molded, glass-fiber concrete composite hand holes:
 - 1. Cable Entrance: Pre-cut 6 inch x 6 inch cable entrance at center bottom of each side.
 - 2. Cover: Glass-fiber concrete composite, weatherproof cover with nonskid finish.
- F. Junction boxes containing fire alarm cabling and devices shall be "red" in color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify locations of outlets in offices and work areas prior to rough-in. Review all casework shop drawings and existing conditions prior to rough in. Report discrepancies to architect for direction.

3.2 INSTALLATION

- A. Install raceway and boxes in accordance with NECA "Standard of Installation."
- B. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- C. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.
- D. Identify raceway and boxes in accordance with Section 26 05 53.
- E. Arrange raceway and boxes to maintain headroom and present neat appearance.
- F. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- G. Maintain headroom and present neat mechanical appearance.
- H. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- I. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- J. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
- K. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- L. Use flush mounting outlet box in finished areas.
- M. Raceways and boxes shall not be mounted to or ran across floors or slabs.

3.3 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29; provide space on each for 25 percent additional raceways.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- F. Do not attach raceway to ceiling support wires or other piping systems.
- G. Construct wireway supports from steel channel specified in Section 26 05 29.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- J. Route conduit in and under slab from point-to-point.
- K. Maintain clearance between raceway and piping for maintenance purposes.
- L. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- M. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- N. Bring conduit to shoulder of fittings; fasten securely.
- O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- P. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- Q. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2 inch size.
- R. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- S. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control and expansion joints.
- T. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- U. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- V. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.

- W. Close ends and unused openings in wireway.
- X. Flexible raceway systems shall not be used to penetrate roofs, floors and air/moisture barriers.
- Y. Raceway systems shall not be routed thru or in HVAC ducts.
- Z. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve. Provide products such as LINK-SEAL
- AA. Provide Color Coded EMT conduit. Utilize different color of EMT to differentiate between wiring systems. Provide color chart for submittal review to allow owner to verify color assignments prior to installation and rough in.
 - 1. Red Fire Alarm
 - 2. Orange Emergency Power
 - 3. Blue Temperature Controls
 - 4. Purple Intercom
 - 5. Yellow Security Systems
 - 6. Black Specialty Equipment To be determined.
 - 7. Green Ground (Service entrance or Telecommunication Grounding System)
 - 8. White Data.
 - 9. Standard Zinc Finish Normal Powered 120V, 208V, 240V, 277V, 480V systems not specified as other color.
- BB. Raceways routed exposed in finished areas shall be painted to match building surroundings. Submit conduit installation plans for exposed area for color assignments.
- CC. Raceway labels shall be applied at intervals not exceeding 10' on center. Apply labels to all feeders, or branch circuits over 60 Amps in size. Provide raceway labels where conduits rise through floors or ceilings, and where they enter panelboards, distribution boards, pull boxes, wireway. Minimum of one raceway label per length of raceway. Raceway labels shall indicate voltage of feeder contained in raceway.

3.4 INSTALLATION - SURFACE RACEWAYS

- A. Install Products in accordance with manufacturer's instructions.
- B. Use screws to fasten raceway channel to surfaces. Drill all tile and brick surfaces or fasten into grout lines to limit the damage to these surfaces. Construction adhesive may be used to assist in the mounting of raceway, but shall not be the primary method of support. Mount plumb and level or align with block joints to create a level appearance.
- C. Close ends of raceway and unused conduit openings.
- D. Ground and bond raceway under provisions of Section 26 05 26.
- E. Provide supplemental lumber furring as required to shim surface raceway off of existing walls to allow for installation around columns, imperfections or other obstructions on face of wall. Furring shall be pine or oak lumber, Grade "A". Plywood or composite wood shall not be acceptable.
- F. Surface raceways shall be routed exposed between floor and ceiling. Raceway system shall not protrude above ceiling, through walls or floors or into nonaccessible spaces.

3.5 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- I. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- K. Install adjustable steel channel fasteners for hung ceiling outlet box.
- L. Do not fasten boxes to ceiling support wires or other piping systems.
- M. Support boxes independently of conduit.
- N. Install gang box where more than one device is mounted together. Do not use sectional box.
- O. Install gang box with plaster ring for single device outlets.
- P. Use cast outlet box in exterior locations exposed to the weather and wet locations.
- Q. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.
- R. Where existing boxes are utilized it shall be the contractors responsibility to modify as required to meet the intent of this specification.

3.6 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using approved materials and methods.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

- E. Contractor shall coordinate the installation of their work with all other contractors of the project.
- F. Install all raceways and boxes provided by this contract to maintain installation, maintenance, operation and working clearances of all equipment, including equipment provided by other trades.
- G. Install all raceways and boxes provided by this contract to maintain installation, maintenance, operation and working clearances of all existing equipment, including existing equipment of other trades.

3.7 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

END OF SECTION 260533
SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

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. Nameplates and labels.
 - 2. Wire and cable markers.
 - 3. Raceway Labels.
 - 4. Junction Box Labeling

1.3 REFERENCES

A. NFPA 70 - National Electrical Code.

1.4 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
 - 1. Locations:
 - a. Each electrical distribution and control equipment enclosure.
 - b. Disconnect, starters, enclosed circuit breakers and transformers
 - c. Security control equipment and enclosures.
 - d. Communication cabinets..
 - 2. Letter Size: Use 1/4 inch letters for identifying equipment and describing area served.
- B. Labels: Machine made labels, Brother P-Type Thermal adhesive tape or similar.
 - 1. Locations:
 - a. Each receptacle faceplate. Confirm installation on back or front of each faceplate with owner and architect prior to installing label.
 - b. Line Voltage Light Switches and Lighting Control Devices. Install on back side of device faceplate.
 - c. Low Voltage Lighting Control Devices. Install on back side of device faceplate.
 - d. Lighting Control Power Packs or Relay Packs. Adhere label to power pack in location so as to not obscure manufactures labels or nameplates.
 - 2. Letter Size: Minimum 1/8 inch indicating panel and circuit serving load. For low Voltage Lighting Control Devices, indicate panel and circuit serving the loads controlled by the Low Voltage Lighting Control Device.

2.2 WIRE MARKERS

- A. Description: Tape, split sleeve, or tubing type wire markers.
- B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
- C. Legend:1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.

2.3 CONDUCTOR COLOR CODING

- A. Description: Color code all wire and cable as scheduled.
- B. Location: Color coding shall be continuous in the wire insulation or jacket. Where colors cannot be provided, apply color coding tape of the color designated in sufficient quantity for permanency at all exposed terminals, loops and splices.
- C. Wire Color Coding Schedule:
 - 1. 120/208V., 3 phase, 4 wire system:
 - A Phase Black
 - B Phase Red
 - C Phase Blue
 - Neutral White
 - Ground Bare or Green
 - 2. 277/480V., 3 phase, 4 wire system:
 - A Phase Brown
 - B Phase Orange

C Phase - Yellow Neutral - Gray Ground - Bare or Green with Yellow Stripe

2.4 BOX MARKERS

A. Description: All junction boxes and device boxes serving fire alarm system devices and wiring shall be "red" in color.

2.5 RACEWAY MARKERS

- A. Provide raceway markers on all raceway for feeders and branch circuits over 60 Amps. Markers shall indicate operating voltage of conductors contained within raceway.
- B. Black letters on orange background. Adhesive applied.
 - 1. Manufactures
 - a. Brady
 - b. Seton

2.6 PANELBOARD SCHEDULES

- A. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads or other field changes
- B. Provide typed circuit directory for each existing panelboard modified under contract. New directory shall include all existing loads previously documented in existing directory and new loads. Identify any breakers in existing panels that do not have load conductors terminated at their lugs and mark as spare. Leave spare breakers in the off position.
- C. All panelboard schedules shall list the date created and the size and location (source panel and room) of the upstream over current protection for the feeder serving the panel.

2.7 JUNCTION/PULL BOX LABELING

- A. All branch circuit junction and pull boxes shall be labeled with the source panel, circuits contained therein and the system voltage. Labeling for boxes smaller then 8"x8" may be applied utilizing permanent marker or machine made labels. Pull boxes then 8"x8" shall be by machine made label only.
- B. All feeder junction and pull boxes shall be labeled with the source panel, load name, and system voltage. Labeling for all feeder junction and pull boxes shall be applied utilizing machine made labels only.

2.8 UNDERGROUND WARNING TAPE

- A. Provide detectable underground warning tape along length of each underground raceway or cable.
- B. Brady B-721 or similar.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws, rivets, or adhesive.
- C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.
- D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.
- E. Provide typed panelboard directories inside all panelboards indicating description of load served.

END OF SECTION 260553

SECTION 265100 - INTERIOR LUMINAIRES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Interior Luminaries and Accessories.
- 2. Exit Signs.
- 3. Ballasts.
- 4. LED Drivers.
- 5. LED Light Fixtures.
- 6. Lamps.

1.3 REFERENCES

- A. ANSI C78.379 Electric Lamps Incandescent and High-Intensity Discharge Reflector Lamps Classification of Beam Patterns.
- B. ANSI C82.1 American National Standard for Lamp Ballast-Line Frequency Fluorescent Lamp Ballast.
- C. ANSI C82.4 Ballasts for High-Intensity Discharge and Low Pressure Sodium Lamps (Multiple Supply Type).
- D. NEMA WD 6 Wiring Devices-Dimensional Requirements.
- E. NFPA 70 National Electrical Code.
- F. NFPA 101 Life Safety Code.
- G. IESNA LM-79-08 Electrical and Photometric Measurements of Solid State Lighting Products.
- H. IESNA LM-80-08 Measuring Lumen Maintenance of LED Light Sources.
- I. UL 8750 Underwriters Laboratories Safety Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products.

1.4 SUBMITTALS FOR REVIEW

- A. See Division 01 for project requirements.
- B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on dimensions, features, performance data, accessories, and finishes.

1.5 QUALITY ASSURANCE

- A. Energy Code Compliance: Applicable requirements in International Energy Conservation Code 2015
 1. Section C405 "Electrical Power and Lighting Systems."
 - 2. Section C408.3 "Lighting System Functional Testing."

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.7 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).
- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

1.8 EXTRA PRODUCTS

- A. See Division 01 for project requirements.
- B. Furnish two of each plastic lens type.
- C. Furnish one case replacement lamps for each lamp type.

1.9 WARRANTY

- A. General Warranty: Special warranty specified in this Section shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranties for LED Drivers: Written warranty, executed by manufacturer agreeing to replace LED drivers that fail in materials or workmanship within specified warranty period.
 - 1. Special Warranty Period for Electronic Ballasts and LED Drivers: Five years from date of manufacture.

PART 2 - PRODUCTS

2.1 LUMINAIRES

A. Furnish Products with features, options and accessories as scheduled.

2.2 LED DRIVERS

- A. Minimum Efficiency: 85% at full load.
- B. Minimum Operating Ambient Temperature: -20°C. (-4°F).
- C. Input Voltage: 120-277V (±10%) at 60 Hz.
- D. Integral short circuit, open circuit, and overload protection.
- E. Power Factor: > 0.90.
- F. Total Harmonic Distortion: < 20%.
- G. LED drivers shall have a fully isolated 0-10V control inputs.
- H. All LED drivers shall be capable of 0-10V dimming with linear dimming curve.

2.3 LED FIXTURES

- A. Color temp to match existing owner stock of fluorescent lamps.
- B. LED fixtures shall be designed as a complete unit consisting of a fully factory assembled unit or as a system of manufacture designed components intended for use as a UL listed complete assembly. The use of retrofit kits or lamps in standard fluorescent, HID or incandescent light fixtures is not acceptable.

2.4 EXIT SIGNS

- A. Furnish Products as scheduled.
- B. General Requirements: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- C. Lamps: LEDs, 50,000 hours minimum rated lamp life.

2.5 EMERGENCY LIGHTING UNITS

- A. Furnish Products as scheduled.
- B. General Requirements: Self-contained units complying with UL 924.
- C. Battery: Sealed, maintenance-free, nickel-cadmium type.
- D. Charger: Fully automatic, solid-state type with sealed transfer relay.
- E. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
- F. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
- G. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
- H. Wire Guard: Heavy-chrome-plated wire guard protects lamp heads or fixtures.
- I. Integral Time-Delay Relay: Holds unit on for fixed interval of 15 minutes when power is restored after an outage.
- 2.6 LIGHTING CONTROL DEVICES
 - A. Manufacturers
 - 1. Basis of design nLight and SensorSwitch by Acuity
 - B. Occupancy Sensors
 - 1. All products are based on Acuity product numbers:
 - 2. Where specified, sensors shall offer daylighting footcandle adjustment control and be able to accommodate dual level lighting.
 - 3. All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.
 - 4. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.
 - 5. All sensors shall have readily accessible, user adjustable controls for time delay and sensitivity. Controls shall be recessed to limit tampering.
 - 6. All sensors shall provide a method of indication to verify that motion is being detected during testing and that the unit is working.
 - 7. All sensors shall have UL rated, 94V-0 plastic enclosures.
 - 8. Refer to drawings for additional notes.
 - C. Circuit Control Hardware
 - 1. Relay Contacts shall have ratings of:
 - a. 20A 120 VAC Driver
 - b. 20A 277 VAC Driver
 - 2. Control wiring between sensors and controls units shall be Class II, 18-24 AWG, stranded UL Classified. Where return air plenum is utilized, all control wiring shall be plenum-rated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Where required install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
- B. Support luminaires independent of ceiling framing.
- C. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
- D. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- E. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure. Provide auxiliary members spanning ceiling grid members to support surface mounted luminaires. Fasten surface mounted luminaires to ceiling grid members using bolts, screws, rivets, or suitable clips. Reuse existing supports if applicable. Provide auxiliary members in compliance with 260529.
- F. Exposed Ceilings: Support luminaires from structural framing members. Provide auxiliary members spanning structural members to support surface mounted and pendent mounted luminaires. Provide auxiliary members in compliance with 260529.
- G. Install recessed luminaires to permit removal from below.
- H. Install recessed luminaires using accessories and fire stopping materials to meet regulatory requirements for fire rating.
- I. Install luminaires recessed in the ceiling with steel cables at opposite ends of the fixture. Secure steel cables to structural member above.
- J. Install wall mounted luminaires, emergency lighting units and exit signs at height as indicated on drawings or as required to serve intended purpose.
- K. Install accessories furnished with each luminaire.
- L. Connect luminaires, emergency lighting units and exit signs to branch circuit outlets provided under Section 26 05 33 using flexible conduit as indicated.
- M. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- N. Bond products and metal accessories to branch circuit equipment grounding conductor.
- O. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.
- P. Prior to installation exit sign may require field relocation to accommodate ceiling heights, structure, Fire Inspector requirements or astetics, include relocation of within ten feet of location shown.

3.2 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 ADJUSTING

- A. Aim and adjust luminaires as indicated or as required to serve intended purpose.
- B. Position exit sign directional arrows as required.

3.4 CLEANING

- A. See Division 01 for project requirements.
- B. Clean electrical parts to remove conductive and deleterious materials.
- C. Remove dirt and debris from enclosures.
- D. Clean photometric control surfaces as recommended by manufacturer.
- E. Clean finishes and touch up damage.

3.5 PROTECTION OF FINISHED WORK

- A. See Division 01 for project requirements.
- B. Replace failed or faulty ballasts or LED modules or LED drivers at Substantial Completion.
- C. Relamp luminaires that have failed lamps at Substantial Completion.

END OF SECTION 265100

SECTION 283100 - FIRE DETECTION AND ALARM

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. This Section covers fire alarm systems, including initiating devices, notification appliances, controls, and supervisory devices.
- B. Work covered by this section includes the furnishing of labor, equipment, and materials for installation of the fire alarm system as indicated on the drawings and specifications. The work covered by this section is to be coordinated with related work as specified elsewhere in the specifications. Requirements of the following sections apply:
 - 1. 260500 Common Results for Electrical.
 - 2. 260526 Grounding and Bonding.
 - 3. 260533 Raceway and Boxes.
- C. The Fire Alarm System shall consist of all necessary hardware equipment and software programming to perform the following functions:
 - 1. Fire alarm system detection and notification operations.
 - 2. Control and monitoring, smoke control equipment, door hold-open devices, fire suppression systems, emergency power systems, and other equipment as indicated in the drawings and specifications.

1.3 SCOPE OF WORK

- A. Expand and modify existing fire alarm system as required to integrate new fire alarm devices as shown on plan. Provide all required materials, labor, programming, owner training as required for complete and operational fire alarm system. System shall meet the requirements of all applicable codes and UL standards. System shall incorporate all existing fire alarm system zones and/or addressable devices.
- B. Prepare product submittals and installation drawings for submittal and submit to the Authority Having Jurisdiction for review and approval.

1.4 ACCEPTABLE EQUIPMENT AND SERVICE PROVIDERS

- A. Manufacturers: The equipment and service described in this specification are those supplied and supported
 - 1. Edwards System Technologies (EST) Contact Thompson Electronics Company 800-323-3300

1.5 SYSTEM DESCRIPTION

- A. The work covered by this specification includes the furnishing of all labor, equipment, materials, and performing all operations in connection with the modified Fire Alarm System as shown on the drawings, hereinafter specified, and as directed by the Architect/Engineer.
 - 1. Modify and expand the existing fire alarm system as shown on the drawings and as required by any additional devices and scope indicated on the drawings or specifications.
 - 2. Provide additional conductors, raceway, NAC panels, Notification and Initiation devices.
 - 3. Provide system programming as required.

1.6 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
 - 1. Product data sheets for system components highlighted to indicate the specific products, features, or functions required to meet this specification. Alternate or as-equal products submitted under this contract must provide a detailed line-by-line comparison of how the submitted product meets, exceeds, or does not comply with this specification.
 - 2. Wiring diagrams from manufacturer.
 - 3. Shop drawings showing system details including location of FACP, all devices, circuiting and details of graphic annunciator.
 - 4. System power and battery charts with performance graphs and voltage drop calculations to assure that the system will operate in accordance with the prescribed backup time periods and under all voltage conditions per UL and NFPA standards.
 - 5. System operation description including method of operation and supervision of each type of circuit and sequence of operations for all manually and automatically initiated system inputs and outputs. A list of all input and output points in the system shall be provided with a label indicating location or use of IDC, SLC, NAC, relay, sensor, and auxiliary control circuits.
 - 6. Operation and maintenance data for inclusion in Operating and Maintenance Manual. Include data for each type product, including all features and operating sequences, both automatic and manual. Provide the names, addresses, and telephone numbers of service organizations.
 - 7. Product certification signed by the manufacturer of the fire alarm system components certifying that their products comply with indicated requirements.
 - 8. Record of field tests of system.
- B. Submission to Authority Having Jurisdiction: In addition to routine submission of the above material, make an identical submission to the authority having jurisdiction. Include copies of shop drawings as required to depict component locations to facilitate review. Upon receipt of comments from the Authority, make resubmissions, if required, to make clarifications or revisions to obtain approval.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A factory authorized installer is to perform the work of this section.
- B. Each and every item of the Fire Alarm System shall be listed under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the "UL" label.

1.8 PROJECT RECORD DOCUMENTS

A. Record actual locations of initiating devices, signaling appliances, and end-of-line devices.

1.9 REGULATORY REQUIREMENTS

- A. Conform to the 2016 Health/Life Safety Code for Public Schools, 23 Illinois Administrative Code 180.
- B. Conform to the 2015 International Building Code (IBC).
- C. Conform to the 2015 International Existing Building Code (IEBC).
- D. Conform to the 2015 International Fuel Gas Code (IFGC).
- E. Conform to the 2015 International Property Maintenance Code (IPMC).
- F. Conform to the 2015 International Fire Code (IFC), excluding Chapter 4.
- G. Conform to the 2018 International Energy Conservation Code (IECC).

- H. Conform to the 2018 Illinois Accessibility Code, 71 Illinois Administrative Code 400.
- I. Conform to 2014 State of Illinois Plumbing Code, 77 Illinois Administrative Code 890.
- J. Conform to the 2013 Illinois State Fire Marshall Boiler and Pressure Vessel Safety Act, 41 Illinois Administrative Code 120.
- K. Conform to the 2015 International Mechanical Code (IMC).
- L. Conform to the 2015 ICC Electrical Code.
- M. Conform to 2014 NFPA 70, National Electrical Code.
- N. Conform to 2013 NFPA 72, National Fire Alarm Code.
- O. Products: Listed and classified by Underwriter's Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. EST
- 2.2 FIRE ALARM AND EQUIPMENT
 - A. Booster Power Supply 120V /w battery charger
 - B. Booster Power Supply 120V
 - C. Primary Power Supply 120V
 - D. Wall mount Strobe, 15, 30, 75, 110cd w/FIRE
 - E. Ceiling mount Strobe, 15, 30, 75. 110cd w/FIRE
 - F. Photoelectric Smoke Detector
 - G. Heat Detector, Fixed Temperature
 - H. Standard Detector Base for 4 inch Square Box
 - I. 12VDC, 45.0 AH Battery
 - J. 12VDC, 7.5AH Battery
 - K. Network Communication Card, Class B/A Net, Class B Audio
 - L. Fire Alarm Power Branch Circuits: Building wire as specified in Section 260519. Control and signaling wire per manufacturers recommendations, plenum rated.
- 2.3 EMERGENCY CONTROL DEVICES
 - A. MAGNETIC DOOR HOLDERS

- Description: Units shall be listed to UL 228. Units are equipped for wall or floor mounting as indicated and are complete with matching door plate. Unit shall operate from a 120VAC, a 24VAC or a 24VDC source, and develop a minimum of 25 lbs. holding force.
- 2. Material and Finish: Match door hardware.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install system components and all associated devices in accordance with applicable NFPA Standards and manufacturer's recommendations.
- B. Installation personnel shall be supervised by persons who are qualified and experienced in the installation, inspection, and testing of fire alarm systems. Examples of qualified personnel shall include, but not be limited to, the following:
 - 1. Factory trained and certified personnel.
 - 2. National Institute of Certification in Engineering Technologies (NICET) fire alarm level II certified personnel.
 - 3. Personnel licensed or certified by state or local authority.

3.2 EQUIPMENT INSTALLATION

- A. Furnish and install a complete Fire Alarm System as described herein and as shown on the plans. Include sufficient control unit(s), annunciator(s), manual stations, automatic fire detectors, smoke detectors, audible and visible notification appliances, wiring, terminations, electrical boxes, ethernet drops, and all other necessary material for a complete operating system.
- B. Existing Fire Alarm Equipment shall be maintained fully operational until the new equipment has been tested and accepted.
- C. Equipment Removal: After acceptance of the new fire alarm system, disconnect and remove the existing fire alarm equipment and restore damaged surfaces. Package operational fire alarm and detection equipment that has been removed and deliver to the Owner. Remove from the site and legally dispose of the remainder of the existing material.
- D. Water-Flow and Valve Supervisory Switches: Connect for each sprinkler valve required to be supervised.
- E. Device Location-Indicating Lights: Locate in the public space immediately adjacent to the device they monitor.
- F. Install manual station with operating handle 48 inches (1.22 m) above floor. Install wall mounted audible and visual notification appliances not less than 80 inches (2.03 m) above floor to bottom of lens and not greater than 96 inches (2.44 m) above floor to bottom of lens.
- G. Mount outlet box for electric door holder to withstand 80 pounds pulling force.
- H. Make conduit and wiring connections to door release devices, sprinkler flow switches, sprinkler valve tamper switches, fire suppression system control panels, duct smoke detectors.
- I. Automatic Detector Installation: Conform to NFPA 72.
- J. Provide synchronization of notification devices.

3.3 PREPARATION

A. Coordinate work of this Section with other affected work and construction schedule.

3.4 WIRING INSTALLATION

- A. System Wiring: Wire and cable shall be a type listed for its intended use by an approval agency acceptable to the Authority Having Jurisdiction and shall be installed in accordance with the appropriate articles from the current approved edition of NFPA 70: National Electric Code (NEC).
- B. Contractor shall obtain from the Fire Alarm System Manufacturer written instruction regarding the appropriate wire/cable to be used for this installation. No deviation from the written instruction shall be made by the Contractor without the prior written approval of the Fire Alarm System Manufacturer.
- C. Color Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color code for alarm initiating device circuits wiring and a different color code for supervisory circuits. Color-code notification appliance circuits differently from alarm-initiating circuits. Paint fire alarm system junction boxes and covers red.
- D. Ethernet circuits shall be provided to the Fire Alarm Control Panel as shown on the plans.
- E. Fire alarm cables installed above accessible ceilings shall be supported via bridal rings from building structure at intervals not exceeding five feet. Cables shall be plenum rated.
- F. Where cables are be concealed behind inaccessible building finishes they shall be installed in conduit.
- G. Where fire alarm cables are to be installed in exposed locations they shall be installed in conduit in unfinished areas such as storage or mechanical spaces. Utilize surface mounted raceway systems for finished areas.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide services of service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.
- B. Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems. Examples of qualified personnel shall be permitted to include, but shall not be limited to, individuals with the following qualifications:
 - 1. Factory trained and certified.
 - 2. National Institute for Certification in Engineering Technologies (NICET) fire alarm certified.
 - 3. Certified by a state or local authority.
 - 4. Trained and qualified personnel employed by an organization listed by a national testing laboratory for the servicing of fire alarm systems.
- C. Pretesting: Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved.
- D. Inspection:
 - 1. Inspect equipment installation, interconnection with system devices, mounting locations, and mounting methods.
 - 2. Verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.
- E. Acceptance Operational Tests:

- 1. Perform operational system tests to verify conformance with specifications:
 - a. Each alarm initiating device installed shall be operationally tested. Each device shall be tested for alarm and trouble conditions. Contractor shall submit a written certification that the Fire Alarm System installation is complete including all punch-list items. Test battery operated emergency power supply. Test emergency power supply to minimum durations specified. Test Supervising Station Signal Transmitter. Coordinate testing with Supervising Station monitoring firm/entity.
 - b. Test each Notification Appliance installed for proper operation. Submit written report indicating sound pressure levels at specified distances.
 - c. Test Fire Alarm Control Panel and Remote Annunciator.
- 2. Provide minimum 10 days notice of acceptance test performance schedule to Owner, and local Authority Having Jurisdiction.
- F. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets the Specifications and complies with applicable standards.
- G. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Use NFPA 72 Forms for documentation.
- H. Final Test, Record of Completion, and Certificate of Occupancy:
 - 1. Test the system as required by the Authority Having Jurisdiction in order to obtain a certificate of occupancy. Provide completed NFPA 72 Record of Completion form to Owner and AHJ.

3.6 CLEANING AND ADJUSTING

- A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Clean unit internally using methods and materials recommended by manufacturer.
- B. Occupancy Adjustments: When requested within one year of date of Substantial Completion, provide onsite assistance in adjusting sound pressure levels and adjusting controls and sensitivities to suit actual occupied conditions. Provide up to three visits to the site for this purpose.

3.7 TRAINING

- A. Provide the services of a factory-authorized service representative to demonstrate the system and train Owner's maintenance personnel as specified below.
 - 1. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventive maintaining of the system. Provide a minimum of 4 hours' training.
 - 2. Schedule training with the Owner at least seven days in advance.

END OF SECTION 283100