Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Purchase Order

Order Date: 09-13-2022

CORRECT ORDER NUMBER MUST APPEAR ON ALL PACKAGES, INVOICES, AND SHIPPING PAPERS. QUESTIONS CONCERNING THIS ORDER SHOULD BE DIRECTED TO THE DEPARTMENT CONTACT.

Order Number:	CPO 0211 4071 GSD2300000003 1
Document Name:	Elevator Modernization Various Facilities (Phase II)
Document Description:	Elevator Modernization Various Facilities (Phase II)
Procurement Type:	Central Purchase Order
Buyer Name:	Melissa Pettrey
Telephone:	(304) 558-0094
Email:	melissa.k.pettrey@wv.gov
Shipping Method:	Best Way
Free on Board:	FOB Dest, Freight Prepaid

Procurement Folder: 1010703
Reason for Modification:
Award of CRFQ GSD2300000011
Effective Start Date:
Effective End Date:

VENDOR

Vendor Customer Code: VS0000037778
SQP CONSTRUCTION GROUP INC
281 SMILEY DR

ST ALBANS WV 25177
US
Vendor Contact Phone: 3045323659 **Extension:**

Discount Details:

	Discount Allowed	Discount Percentage	Discount Days
#1	No	0.0000	0
#2	Not Entered		
#3	Not Entered		
#4	Not Entered		

DEPARTMENT CONTACT

Requestor Name: Patrick S O'Neill
Requestor Phone: 304-352-5492
Requestor Email: patrick.s.oneill@wv.gov

23
FILE LOCATION _____

INVOICE TO

DEPARTMENT OF ADMINISTRATION
GENERAL SERVICES DIVISION
103 MICHIGAN AVENUE
CHARLESTON WV 25305
US

SHIP TO

STATE OF WEST VIRGINIA
JOBSITE - SEE SPECIFICATIONS
No City WV 99999
US

9-20-22 BK

Total Order Amount:	$6,991,150.00

Purchasing Division's File Copy

ENTERED

MKP 09/15/2022

PURCHASING DIVISION AUTHORIZATION	**ATTORNEY GENERAL APPROVAL AS TO FORM**	**ENCUMBRANCE CERTIFICATION**
DATE: 09/15/22	**DATE:** 9/28/2022	**DATE:** 9/28/2022
ELECTRONIC SIGNATURE ON FILE	**ELECTRONIC SIGNATURE ON FILE**	**ELECTRONIC SIGNATURE ON FILE**

Extended Description:
One Time Purchase (CPO)

The Vendor, SQP Construction Group, Inc., of St. Albans, WV agrees to enter this One-Time Purchase contract with the WV Department of Administration, General Services Division ("Agency" and "Owner") for Elevator Modernizations Various Facilities (Phase 2) project in several State-Owned buildings in Charleston, WV, The Project consists of the replacement of five (5) traction elevators (Cars #1, 2, 3, 4, & 6) in Building 5, the replacement of one (1) hydraulic elevator in Building 15, the replacement of the pump unit and controls in the Building 17 hydraulic elevator, the replacement of one (1) hydraulic elevator in Building 84, and the replacement of two (2) hydraulic elevators in Building 86 per the specifications, project manual, termsand conditions, addendum No. 1 dated 08/11/2022, addendum no.2 dated 08/11/2022 and the Vendors submitted and accepted bid dated 08/30/2022 incorporated herein by reference and made a part hereof.

Miller Engineering, Inc., is serving as the Engineer on this project.

Line	Commodity Code	Quantity	Unit	Unit Price	Total Price
1	72154010	0.00000		0.000000	4426200.00
Service From	**Service To**	**Manufacturer**		**Model No**	

Commodity Line Description: Elevator Modernization Project (Phase II): Building 5

Extended Description:
Elevator Modernization Project (Phase II): Building 5

Line	Commodity Code	Quantity	Unit	Unit Price	Total Price
2	72154010	0.00000		0.000000	502900.00
Service From	**Service To**	**Manufacturer**		**Model No**	

Commodity Line Description: Elevator Modernization Project (Phase II): Building 15

Extended Description:
Elevator Modernization Project (Phase II): Building 15

Line	Commodity Code	Quantity	Unit	Unit Price	Total Price
3	72154010	0.00000		0.000000	488450.00
Service From	**Service To**	**Manufacturer**		**Model No**	

Commodity Line Description: Elevator Modernization Project (Phase II): Building 17

Extended Description:
Elevator Modernization Project (Phase II): Building 17

Line	Commodity Code	Quantity	Unit	Unit Price	Total Price
4	72154010	0.00000		0.000000	543600.00
Service From	**Service To**	**Manufacturer**		**Model No**	

Commodity Line Description: Elevator Modernization Project (Phase II): Building 84

Extended Description:
Elevator Modernization Project (Phase II): Building 84

Line	Commodity Code	Quantity	Unit	Unit Price	Total Price
5	72154010	0.00000		0.000000	1030000.00
Service From	**Service To**	**Manufacturer**		**Model No**	

Commodity Line Description: Elevator Modernization Project (Phase II): Building 86

Extended Description:
Elevator Modernization Project (Phase II): Building 86

GENERAL TERMS AND CONDITIONS:

1. CONTRACTUAL AGREEMENT: Issuance of an Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance by the State of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid, or on the Contract if the Contract is not the result of a bid solicitation, signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. DEFINITIONS: As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.

2.1. "Agency" or **"Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

2.2. "Bid" or **"Proposal"** means the vendors submitted response to this solicitation.

2.3. "Contract" means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.

2.4. "Director" means the Director of the West Virginia Department of Administration, Purchasing Division.

2.5. "Purchasing Division" means the West Virginia Department of Administration, Purchasing Division.

2.6. "Award Document" means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.

2.7. "Solicitation" means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.

2.8. "State" means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

2.9. "Vendor" or **"Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

☐ **Term Contract**

Initial Contract Term: The Initial Contract Term will be for a period of _____ _____. The Initial Contract Term becomes effective on the effective start date listed on the first page of this Contract, identified as the State of West Virginia contract cover page containing the signatures of the Purchasing Division, Attorney General, and Encumbrance clerk (or another page identified as _____), and the Initial Contract Term ends on the effective end date also shown on the first page of this Contract.

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal should be delivered to the Agency and then submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to _____ successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

☐ **Alternate Renewal Term** – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

☑ **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within Three-Hundred and Sixty Five (365) days.

☐ **Fixed Period Contract with Renewals:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that:

☐ the contract will continue for _____ years;

☐ the contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's Office (Attorney General approval is as to form only).

☐ **One-Time Purchase:** The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

☐ **Construction/Project Oversight:** This Contract becomes effective on the effective start date listed on the first page of this Contract, identified as the State of West Virginia contract cover page containing the signatures of the Purchasing Division, Attorney General, and Encumbrance clerk (or another page identified as _____), and continues until the project for which the vendor is providing oversight is complete.

☐ **Other:** Contract Term specified in _____

4. AUTHORITY TO PROCEED: Vendor is authorized to begin performance of this contract on the date of encumbrance listed on the front page of the Award Document unless either the box for "Fixed Period Contract" or "Fixed Period Contract with Renewals" has been checked in Section 3 above. If either "Fixed Period Contract" or "Fixed Period Contract with Renewals" has been checked, Vendor must not begin work until it receives a separate notice to proceed from the State. The notice to proceed will then be incorporated into the Contract via change order to memorialize the official date that work commenced.

5. QUANTITIES: The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

☐ **Open End Contract:** Quantities listed in this Solicitation/Award Document are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

☐ **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

☑ **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

☐ **One-Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. EMERGENCY PURCHASES: The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute of breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One-Time Purchase contract.

7. REQUIRED DOCUMENTS: All of the items checked in this section must be provided to the Purchasing Division by the Vendor as specified:

☑ **BID BOND (Construction Only):** Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

☑ **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract. The performance bond must be received by the Purchasing Division prior to Contract award.

☑ **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under $100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

☑ **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

☐ **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits upon request and in a form acceptable to the State. The request may be prior to or after contract award at the State's sole discretion.

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The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications regardless of whether or not that requirement is listed above.

8. INSURANCE: The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether that insurance requirement is listed in this section.

Vendor must maintain:

☑ **Commercial General Liability Insurance** in at least an amount of: $1,000,000.00 per occurrence.

☑ **Automobile Liability Insurance** in at least an amount of: $1,000,000.00 per occurrence.

☐ **Professional/Malpractice/Errors and Omission Insurance** in at least an amount of: _____ per occurrence. Notwithstanding the forgoing, Vendor's are not required to list the State as an additional insured for this type of policy.

☑ **Commercial Crime and Third Party Fidelity Insurance** in an amount of: $100,000.00 per occurrence.

☐ **Cyber Liability Insurance** in an amount of: _____ per occurrence.

☐ **Builders Risk Insurance** in an amount equal to 100% of the amount of the Contract.

☐ **Pollution Insurance** in an amount of: _____ per occurrence.

☐ **Aircraft Liability** in an amount of: _____ per occurrence.

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Notwithstanding anything contained in this section to the contrary, the Director of the Purchasing Division reserves the right to waive the requirement that the State be named as an additional insured on one or more of the Vendor's insurance policies if the Director finds that doing so is in the State's best interest.

9. WORKERS' COMPENSATION INSURANCE: Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

10. [Reserved]

11. LIQUIDATED DAMAGES: This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

☐ _____ for _____.

☑ Liquidated Damages Contained in the Specifications.

☐ Liquidated Damages Are Not Included in this Contract.

12. ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

13. PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

14. PAYMENT IN ARREARS: Payments for goods/services will be made in arrears only upon receipt of a proper invoice, detailing the goods/services provided or receipt of the goods/services, whichever is later. Notwithstanding the foregoing, payments for software maintenance, licenses, or subscriptions may be paid annually in advance.

15. PAYMENT METHODS: Vendor must accept payment by electronic funds transfer and P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

16. TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

17. ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia, included in the Contract, or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

18. FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available. If that occurs, the State may notify the Vendor that an alternative source of funding has been obtained and thereby avoid the automatic termination. Non-appropriation or non-funding shall not be considered an event of default.

19. CANCELLATION: The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-5.2.b.

20. TIME: Time is of the essence regarding all matters of time and performance in this Contract.

21. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code, or West Virginia Code of State Rules is void and of no effect.

22. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

> **SUBCONTRACTOR COMPLIANCE:** Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

23. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

24. MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.

25. WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

26. SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

27. ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments.

28. WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

29. STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

30. PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/default.html.

31. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

32. LICENSING: In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

33. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

34. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

35. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

36. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

37. NO DEBT CERTIFICATION: In accordance with West Virginia Code §§ 5A-3-10a and 5-22-1(i), the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State. By submitting a bid, or entering into a contract with the State, Vendor is affirming that (1) for construction contracts, the Vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, neither the Vendor nor any related party owe a debt as defined above, and neither the Vendor nor any related party are in employer default as defined in the statute cited above unless the debt or employer default is permitted under the statute.

38. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

39. REPORTS: Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

☑ Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

☐ Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.division@wv.gov.

40. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check. Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

41. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.

b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process.

c. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:

   1. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars ($2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or

   2. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

42. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars ($50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a "substantial labor surplus area", as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel

products. This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

43. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE: W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least $1 million, the Vendor must submit to the Agency a disclosure of interested parties prior to beginning work under this Contract. Additionally, the Vendor must submit a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-work interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

44. PROHIBITION AGAINST USED OR REFURBISHED: Unless expressly permitted in the solicitation published by the State, Vendor must provide new, unused commodities, and is prohibited from supplying used or refurbished commodities, in fulfilling its responsibilities under this Contract.

45. VOID CONTRACT CLAUSES – This Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law.

46. ISRAEL BOYCOTT: Bidder understands and agrees that, pursuant to W. Va. Code § 5A-3-63, it is prohibited from engaging in a boycott of Israel during the term of this contract.

ADDITIONAL TERMS AND CONDITIONS (Construction Contracts Only)

1. CONTRACTOR'S LICENSE: Until June 15, 2021, West Virginia Code § 21-11-2, and after that date, § 30-42-2, requires that all persons desiring to perform contracting work in this state be licensed. The West Virginia Contractors Licensing Board is empowered to issue the contractor's license. Applications for a contractor's license may be made by contacting the West Virginia Contractor Licensing Board.

The apparent successful Vendor must furnish a copy of its contractor's license prior to the issuance of a contract award document.

2. DRUG-FREE WORKPLACE AFFIDAVIT: W. Va. Code § 21-1D-5 provides that any solicitation for a public improvement contract requires each Vendor that submits a bid for the work to submit an affidavit that the Vendor has a written plan for a drug-free workplace policy. If the affidavit is not submitted with the bid submission, the Purchasing Division shall promptly request by telephone and electronic mail that the low bidder and second low bidder provide the affidavit within one business day of the request. Failure to submit the affidavit within one business day of receiving the request shall result in disqualification of the bid. To comply with this law, Vendor should complete the enclosed drug-free workplace affidavit and submit the same with its bid. Failure to submit the signed and notarized drugfree workplace affidavit or a similar affidavit that fully complies with the requirements of the applicable code, within one business day of being requested to do so shall result in disqualification of Vendor's bid. Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is $100,000 or less or temporary or emergency repairs.

2.1. DRUG-FREE WORKPLACE POLICY: Pursuant to W. Va. Code § 21-1D-4, Vendor and its subcontractors must implement and maintain a written drug-free workplace policy that complies with said article. The awarding public authority shall cancel this contract if: (1) Vendor fails to implement and maintain a written drug-free workplace policy described in the preceding paragraph, (2) Vendor fails to provide information regarding implementation of its drug-free workplace policy at the request of the public authority; or (3) Vendor provides to the public authority false information regarding the contractor's drug-free workplace policy.

Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is $100,000 or less or temporary or emergency repairs.

3. DRUG FREE WORKPLACE REPORT: Pursuant to W. Va. Code § 21-1D-7b, no less than once per year, or upon completion of the project, every contractor shall provide a certified report to the public authority which let the contract. For contracts over $25,000, the public authority shall be the West Virginia Purchasing Division. For contracts of $25,000 or less, the public authority shall be the agency issuing the contract. The report shall include:

(1) Information to show that the education and training service to the requirements of West Virginia Code § 21-1D-5 was provided;

(2) The name of the laboratory certified by the United States Department of Health and Human Services or its successor that performs the drug tests;

(3) The average number of employees in connection with the construction on the public improvement;

(4) Drug test results for the following categories including the number of positive tests and the number of negative tests: (A) Pre-employment and new hires; (B) Reasonable suspicion; (C) Post-accident; and (D) Random.

Vendor should utilize the attached Certified Drug Free Workplace Report Coversheet when submitting the report required hereunder. Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is $100,000 or less or temporary or emergency repairs.

4. AIA DOCUMENTS: All construction contracts that will be completed in conjunction with architectural services procured under Chapter 5G of the West Virginia Code will be governed by the attached AIA documents, as amended by the Supplementary Conditions for the State of West Virginia, in addition to the terms and conditions contained herein.

4A. PROHIBITION AGAINST GENERAL CONDITIONS: Notwithstanding anything contained in the AIA Documents or the Supplementary Conditions, the State of West Virginia will not pay for general conditions, or winter conditions, or any other condition representing a delay in the contracts. The Vendor is expected to mitigate delay costs to the greatest extent possible and any costs associated with Delays must be specifically and concretely identified. The state will not consider an average daily rate multiplied by the number of days extended to be an acceptable charge.

5. GREEN BUILDINGS MINIMUM ENERGY STANDARDS: In accordance with § 22-29-4, all new building construction projects of public agencies that have not entered the schematic design phase prior to July 1, 2012, or any building construction project receiving state grant funds and appropriations, including public schools, that have not entered the schematic design phase prior to July 1, 2012, shall be designed and constructed complying with the ICC International Energy Conservation Code, adopted by the State Fire Commission, and the ANSI/ASHRAE/IESNA Standard 90.1-2007: Provided, That if any construction project has a commitment of federal funds to pay for a portion of such project, this provision shall only apply to the extent such standards are consistent with the federal standards.

6. LOCAL LABOR MARKET HIRING REQUIREMENT: Pursuant to West Virginia Code §21-1C-1 et seq., Employers shall hire at least seventy-five percent of employees for public improvement construction projects from the local labor market, to be rounded off, with at least two
employees from outside the local labor market permissible for each employer per project.

Any employer unable to employ the minimum number of employees from the local labor market shall inform the nearest office of Workforce West Virginia of the number of qualified employees needed and provide a job description of the positions to be filled.

If, within three business days following the placing of a job order, Workforce West Virginia is unable to refer any qualified job applicants to the employer or refers less qualified job applicants than the number requested, then Workforce West Virginia shall issue a waiver to the employer

stating the unavailability of applicant and shall permit the employer to fill any positions covered by the waiver from outside the local labor market. The waiver shall be in writing and shall be issued within the prescribed three days. A waiver certificate shall be sent to both the employer for its permanent project records and to the public authority.

Any employer who violates this requirement is subject to a civil penalty of $250 per each employee less than the required threshold of seventy-five percent per day of violation after receipt of a notice of violation.

Any employer that continues to violate any provision of this article more than fourteen calendar days after receipt of a notice of violation is subject to a civil penalty of $500 per each employee less than the required threshold of seventy-five percent per day of violation.

The following terms used in this section have the meaning shown below.

(1) The term "construction project" means any construction, reconstruction, improvement, enlargement, painting, decorating or repair of any public improvement let to contract in an amount equal to or greater than $500,000. The term "construction project" does not include temporary or emergency repairs;

(2) The term "employee" means any person hired or permitted to perform hourly work for wages by a person, firm or corporation in the construction industry; The term "employee" does not include:(i) Bona fide employees of a public authority or individuals engaged in making temporary or emergency repairs;(ii) Bona fide independent contractors; or(iii) Salaried supervisory personnel necessary to assure efficient execution of the employee's work;

(3) The term "employer" means any person, firm or corporation employing one or more employees on any public improvement and includes all contractors and subcontractors;

(4) The term "local labor market" means every county in West Virginia and any county outside of West Virginia if any portion of that county is within fifty miles of the border of West Virginia;

(5) The term "public improvement" includes the construction of all buildings, roads, highways, bridges, streets, alleys, sewers, ditches, sewage disposal plants, waterworks, airports and all other structures that may be let to contract by a public authority, excluding improvements funded, in whole or in part, by federal funds.

7. DAVIS-BACON AND RELATED ACT WAGE RATES:

☐ The work performed under this contract is federally funded in whole, or in part. Pursuant to _____, Vendors are required to pay applicable Davis-Bacon wage rates.

☑ The work performed under this contract is not subject to Davis-Bacon wage rates.

8. SUBCONTRACTOR LIST SUBMISSION: In accordance with W. Va. Code § 5-22-1, the apparent low bidder on a contract valued at more than $250,000.00 for the construction, alteration, decoration, painting or improvement of a new or existing building or structure shall submit a list of all subcontractors who will perform more than $25,000.00 of work on the project including labor and materials. (This section does not apply to any other construction projects, such as highway, mine reclamation, water or sewer projects.) The subcontractor list shall be provided to the Purchasing Division within one business day of the opening of bids for review.
If the apparent low bidder fails to submit the subcontractor list, the Purchasing Division shall promptly request by telephone and electronic mail that the low bidder and second low bidder provide the subcontractor list within one business day of the request. Failure to submit the subcontractor list within one business day of receiving the request shall result in disqualification of the bid.

If no subcontractors who will perform more than $25,000.00 of work are to be used to complete the project, the apparent low bidder must make this clear on the subcontractor list, in the bid itself, or in response to the Purchasing Division's request for the subcontractor list.

a. Required Information. The subcontractor list must contain the following information:

i. Bidder's name

ii. Name of each subcontractor performing more than $25,000 of work on the project.

iii. The license number of each subcontractor, as required by W. Va. Code § 21-11-1 et. seq.

iv. If applicable, a notation that no subcontractor will be used to perform more than $25,000.00 of work. (This item iv. is not required if the vendor makes this clear in the bid itself or in documentation following the request for the subcontractor list.)

b. Subcontractor List Submission Form: The subcontractor list may be submitted in any form, including the attached form, as long as the required information noted above is included. If any information is missing from the bidder's subcontractor list submission, it may be obtained from other documents such as bids, emails, letters, etc. that accompany the subcontractor list submission.

c. Substitution of Subcontractor. Written approval must be obtained from the State Spending Unit before any subcontractor substitution is permitted. Substitutions are not permitted unless:

i. The subcontractor listed in the original bid has filed for bankruptcy;

ii. The subcontractor in the original bid has been debarred or suspended; or

iii. The contractor certifies in writing that the subcontractor listed in the original bid fails, is unable, or refuses to perform his subcontract.

Subcontractor List Submission (Construction Contracts Only)

Bidder's Name: SQP Construction Group Inc.

☐ Check this box if no subcontractors will perform more than $25,000.00 of work to complete the project.

Subcontractor Name	License Number if Required by W. Va. Code § 21-11-1 et. seq.
Prizm Painting LLC.	WV038686 Painting
West Virginia Elevator	WV061175 Elevators
Nitro Construction Services Inc.	WV042601 Fire Protection/Electrical
Wood Heating and A/C	WV056776 Plumbing/HVAC

Attach additional pages if necessary

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Name, Title) [signature] President

(Printed Name and Title) Donald O. Gatewood, President

(Address) 281 Smiley Drive, St. Albans, WV 25177

(Phone Number) / (Fax Number) 304-440-9200

(email address) dgatewood@sqpgc.com

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through *wv*OASIS, I certify that: I have reviewed this Solicitation/Contract in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation/Contract for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, the entity entering into this contract is prohibited from engaging in a boycott against Israel.

SQP Construction Group Inc.
(Company)

[signature] President
(Authorized Signature) (Representative Name, Title)

Donald O. Gatewood, President 8-30-22
(Printed Name and Title of Authorized Representative) (Date)

304-440-9200
(Phone Number) (Fax Number)

dgatewood@sqpgc.com
(Email Address)

GENERAL CONSTRUCTION SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of the WV Department of Administration, General Services Division ("Agency" and "Owner") to establish a contract for Elevator Modernizations Various Facilities (Phase 2) project in several State-Owned buildings in Charleston, WV, per the attached Specifications and Project Manual. The Project consists of the replacement of five (5) traction elevators (Cars #1, 2, 3, 4, & 6) in Building 5, the replacement of one (1) hydraulic elevator in Building 15, the replacement of the pump unit and controls in the Building 17 hydraulic elevator, the replacement of one (1) hydraulic elevator in Building 84, and the replacement of two (2) hydraulic elevators in Building 86. Miller Engineering, Inc., is serving as the Engineer on this project.

   One mandatory pre-bid meeting will be held for this project, where the Vendors, Agency, And Engineer will travel to five (5) locations in Charleston, WV. The sole date for these visits will be August 9th, 2022 starting at 9:30AM. Bidders must attend the pre-bid meeting in order to be eligible to be awarded a contract resulting from this solicitation. The Agency should have their existing elevator maintenance contractor available to lockout cars as needed for inspection, etc., during the walk-throughs proceeding the pre-bid meeting. This will be the only opportunity to examine the non-public spaces associated with the elevator cars.

   Location 1 – Building 4, 112 California Avenue, Charleston, WV, 25305. First floor conference room. Pre-bid begins here at 9:30AM. We will walk to Building 5 from here.

   Location 2 – Building 15, 2019 Washington Street East, Charleston, WV 25305. Meet in front of main entrance to building.

   Location 3 – Building 17, 2101 Washington Street East, Charleston, WV, 25305. Meet in front of main entrance to building.

   Location 4 – Building 86, 1124 Smith Street, Charleston, WV, 25301. Meet behind the building in the parking lot.

   Location 5 – Building 84, 1409 Greenbrier Street, Charleston, WV, 25311. Meet in front of main entrance to building.

2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions and in the Specification's Manual as defined below.

   2.1 "Construction Services" means the replacement of five (5) traction elevators (Cars #1, 2, 3, 4, & 6) in Building 5, the replacement of one (1) hydraulic elevator in Building 15, the replacement of the pump unit and controls in the Building 17 hydraulic elevator, the replacement of one (1) hydraulic elevator in Building 84, and the replacement of two (2) hydraulic elevators in Building 86, as more fully described in these specifications and the Project Manual.

   2.2 "Pricing Page" means the pages contained in wvOASIS, attached hereto as Exhibit A, upon which Vendor should list its proposed price for the Construction Services.

   2.3 "Solicitation" means the official notice of an opportunity to supply the State with Construction Services that is published by the Purchasing Division.

   2.4 "Specifications/Project Manual" means the American Institute of Architect forms, specifications, plans, drawings, and related documents developed by the architect, engineer, or Agency that provide detailed instructions on how the Construction Services are to be performed along with any American Institute of Architects documents ("AIA documents") attached thereto.

3. **ORDER OF PRECEDENCE:** This General Construction Specifications document will have priority over, and supersede, anything contained in the Specifications/Project Manual.

4. **QUALIFICATIONS:** Vendor, or Vendor's staff if requirements are inherently limited to individuals rather than corporate entities, shall have the following minimum qualifications:

   a. **Experience:** Vendor, or Vendor's supervisory staff assigned to this project, must have successfully completed at least Three (3) projects that involved work similar to that described in the Specifications/Project Manual. Compliance with this experience requirement will be determined prior to contract award by the State through references provided by the Vendor upon request, through knowledge or documentation of the Vendor's past projects, through confirmation of experience requirements from the architect assisting the State in this project, or some other method that the State determines to be acceptable. Vendor must provide any documentation requested by the State to assist in confirmation of compliance with this provision. References, documentation, or other information to confirm compliance with this experience requirement may be requested after bid opening and prior to contract award.

5. **CONTRACT AWARD:** The Contract is intended to provide Agency with a purchase price for the Construction Services. The Contract will be awarded to the lowest qualified responsible bidder meeting the required specifications. If the Pricing Pages contain alternates/add-ons, the Contract will be awarded based on the grand total of the base bid and any alternates/add-ons selected.

   5.1 All bidders are required to provide a copy of the completed Exhibit A pricing page **with their bid.**

6. **SELECTION OF ALTERNATES:** Pursuant to W. Va. Code § 5-22-1(f), any solicitation of bids shall include no more than five alternates. Alternates, if accepted, shall be accepted in the order in which they are listed on the bid form. Any unaccepted alternate contained within a bid shall expire 90 days after the date of the opening of bids for review. Determination of the lowest qualified responsible bidder shall be based on the sum of the base bid and any alternates accepted. Alternate selection will be identified in the Purchase Order.

7. **PROGRESS PAYMENTS:** The Vendor will be paid in the form of periodic progress payments for work completed. Payment requests along with documentation supporting the request will be submitted to and reviewed by the Architect. If approved, the Architect will communicate approval to the Owner and Owner will process payment. The Owner reserves the right to withhold liquidated damages from progress payments. Progress payments will be made no more than monthly.

   Approval and payment of progress payments will be based on Contractor's submission of a payment allocation schedule which allocates the entire contract sum to payment milestones. Architect and Owner will review the payment allocation and may mandate changes that they believe are necessary.

8. **RETAINAGE:** Agency is entitled to withhold Ten Percent (10%) from each progress payment made as retainage. Agency will partially release retainage upon certification of substantial completion by the Architect in accordance with this Contract but will continue to retain amounts sufficient to cover activities needed to reach final completion.

9. **PERFORMANCE:** Vendor shall perform the Construction Services in accordance with this document and the Specifications/Project Manual.

10. **SUBSTANTIAL AND FINAL COMPLETION:** Vendor shall achieve Substantial Completion by Three-Hundred and Thirty-Five (335) calendar days and Final Completion by Three-Hundred and Sixty-Five (365) calendar days after the Contract start date established by the issuance of the Notice to Proceed. Failure to meet the deadlines established herein, unless extended by change order authorizing additional time free of liquidated damages, will result in liquidated damages being applied.

11. **LIQUIDATED DAMAGES:** Vendor shall pay Liquidated Damages in the amount of $1,000.00 per calendar day for every calendar day beyond the date for Substantial Completion of the overall contract, as established by the issuance of the Notice to Proceed, for which Substantial Completion of the overall project has not been achieved.

12. **PROJECT PLANS:** Copies of the project plans can be obtained by contacting the entity identified below.

12.1. Hard Copies of the plans and specifications may be obtained from:

Miller Engineering, Inc.
54 West Run Road
Morgantown, WV 26508
Phone: 304-291-2234, ext 2 (Attn: Craig Miller)
Email: cmiller@millereng.net

by interested parties by paying $525.00 each for sets of printed/bound documents and/or $55.00ea for a digital set (CD-ROM), plus the cost of mailing, if applicable; however, such cost is not refundable.

Copies of project plans can be examined at the following locations:

Kanawha Valley Builders Association
1627 Bigley Avenue
Charleston, WV 25302
Phone: 304-342-7141
Fax: 304-343-8014
Email: luther@kvba.com

Contractors Association of West Virginia
2114 Kanawha Boulevard East
Charleston, West Virginia 25311
Phone: 304-342-1166
Fax: 304-342-1074
Email: planroom@cawv.org

Construction Employers Association NCWV
2794 White Hall Blvd
White Hall, WV 26554
Phone: 304-367-1290
Fax: 304-367-0126
Email: ceaplanroom@ceawv.com

Parkersburg Marietta Contractors Association
2905 Emerson Avenue
Parkersburg, WV 26104
Phone: 304-485-6485
Fax: 304-428-7622
Email: pmcadesk@gmail.com

Reed Construction Data
30 Technology Parkway South
Suite 100
Norcross, GA 30092
Phone: 800-364-2059
Fax: 800-317-0870
Email: projectinquiries@isqft.com

Pennsylvania Builders Exchange
1813 N. Franklin Street
Pittsburgh, PA 15233
Phone: 412-922-4200
Fax: 412-928-9406
Email: karen@pbe.org

Dodge Data and Analytics
4300 Beltway Place, Suite 180
Arlington, TX 76018-5253
Phone: 800-393-6343
Email: support@construction.com

Ohio Valley Construction Employer's Council
21 Armory Drive
Wheeling, WV 26003
Phone: (304)242-0520
Fax: (304)242-7261
Email: ovcec@ovcec.com

13. **SUBSTITUTIONS:** Any substitution requests must be submitted in accordance with the official question and answer period described in the INSTRUCTIONS TO VENDORS SUBMITTING BIDS, Paragraph 4. Vendor Question Deadline. Bidders are encouraged to include sufficient information with any technical question requesting review of a potential substitution. The Agency reserves the right to not provide approval or rejection of a substitution request by technical question if the bidder does not submit sufficient documentation with their question for the Agency to conclude compliance of the requested substitution with all applicable specifications.

14. FACILITIES ACCESS: Performance of Contract Services may require access cards and/or keys to gain entrance to Agency's facilities. In the event that access cards and/or keys are required:

14.1. Vendor must identify principal service personnel which will be issued access cards and/or keys to perform service.

14.2. Vendor will be responsible for controlling cards and keys and will pay replacement fee, if the cards or keys become lost or stolen.

14.3. Vendor shall notify Agency immediately of any lost, stolen, or missing card or key.

14.4. Anyone performing under this Contract will be subject to Agency's security protocol and procedures.

14.5. Vendor shall inform all staff of Agency's security protocol and procedures.

15. MISCELLANEOUS:

15.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: _____

Telephone Number: _____

Fax Number: _____

Email Address: _____

15.2. Owner's Representative: Owner's representative for notice purposes is

Name:	**Patrick S ONeill**
Telephone Number:	**(304)352-5514**
Fax Number:	**(304)558-1475**
Email Address:	**patrick.s.oneill@wv.gov**

16. Initial Decision Maker: Miller Engineering, Inc., the Engineer, shall serve as the Initial Decision Maker in matters relating to this contract.

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Centralized Request for Quote
Construction

Proc Folder: 1010703	**Reason for Modification:**
Doc Description: Elevator Modernization Various Facilities (Phase II)	Addendum No. 1. Please see attached documents.
Proc Type: Central Purchase Order	

Date Issued	Solicitation Closes	Solicitation No	Version
2022-08-11	2022-08-30 13:30	CRFQ 0211 GSD2300000011	2

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Customer Code:

Vendor Name :

Address :

Street :

City :

State : **Country :** **Zip :**

Principal Contact :

Vendor Contact Phone: **Extension:**

FOR INFORMATION CONTACT THE BUYER
Melissa Pettrey
(304) 558-0094
melissa.k.pettrey@wv.gov

Vendor Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

SOLICITATION NUMBER: CRFQ GSD2300000011
Addendum Number: 1

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

[ ] Modify bid opening date and time

[ ] Modify specifications of product or service being sought

[ ] Attachment of vendor questions and responses

[✓] Attachment of pre-bid sign-in sheet

[ ] Correction of error

[✓] Other

Description of Modification to Solicitation:

1. There will be a day for secondary walk throughs as well as times for each building to be available in attached documnetation.
2. See attached for clarifications and pre-bid sign-in sheet.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.

2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

MILLER

ADDENDUM #1

Project Name: WV GSD Elevator Modernizations – Phase 2 CRFQ GSD 23-11
Date: 8/10/2022
Addendum #: 1

Non-Mandatory Pre-Bid Conference:

1. The mandatory prebid was held on 9Aug22 at 9:30AM. A walk-through of the systems in the project was conducted following the meeting.

Clarifications:

1. In Building 5, the elevator lobbies have stand-alone (not centrally connected or monitored) smoke detectors. All stand-alone smokes, heats, devices and any associated wiring or relays, etc. will be removed and replaced with smokes, heats tied to the fire alarm system. Any additional FA Devices required to make the elevators fully compliant with NFPA 72 and ANSI A17.1-2013 requirements are included in the project. This includes all the operational interconnects, fireman's hat, etc. between the elevators and the fire alarm system. This is a performance based requirement with delegated design of the FA changes. Fire alarm installer is responsible for surveying and verifying the existing conditions prior to bidding.
2. Fire Protection includes the extension of existing as necessary to provide coverage in the project elevator shafts and machine rooms, with the exception of Building 15 which is not sprinkled. This is a performance based requirement with delegated design of the FP changes. Fire protection installer is responsible for surveying and verifying the existing conditions prior to bidding.

Administrative:

1. The Pre-bid sign in sheet is attached to this Addendum.
2. **A second walk-through opportunity** has been created. It will be held on Tuesday August 16, 2022 and will follow the schedule below:

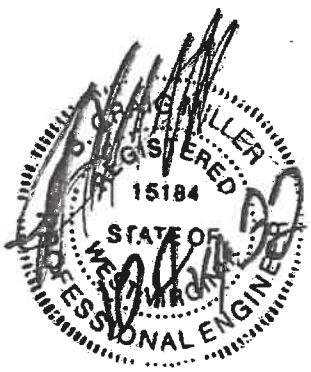
   Building 5: 8:30AM – 10AM
   Buildings 17/15: 10:15AM – 11AM (start at Building 17)
   Building 86: 12PM – 1PM
   Building 84: 1:30PM to 2PM

   Participants are to meet at the building entrance at the designated start time for each building. In the case of Building 5, enter and meet at the security station in Building 7.

All herein becomes part of the scope project documents and the scope of project work. Contractor is to acknowledge this as Addendum #1 on the Bid Form.

Respectfully submitted this 10th day of August 2022.

Craig Miller PE
President
Miller Engineering, Inc.



Pre-Bid Sign-In Sheet

Solicitation Number: CRFQ GSD2300000011
Date of Pre-Bid Meeting: August 9, 2022
Location of Prebid Meeting: Building 4 California Ave, Charleston, WV, 25305

Please Note:
Vendors must sign-in on this sheet to verify attendance at the Pre-Bid meeting.
Failure to legibly sign in may be grounds for declaring a vendor ineligible to bid.
For further verification, please also provide a business card if possible.

Firm Represented:*	Rep Name (Printed):	Firm Address:	Telephone #:	Fax #:	Email:
SQP	Jason Phillips	281 Smiley Drive St Albans WV 25177	304 532 3659		estimating @ sqpgc.com
MURPHY	WALT BAKE	128 E MAIN ST LOUISVILLE, KY	304-389-0292		walt@murphyelevator.com
MURPHY	JOE KEELING	128 E MAIN ~~ST~~ ST LOUISVILLE, KY 40202	502-909-4653		Joe@Murphyelevator.com
OTIS	Gary Roberts	4708 Chimney Dr Charleston, WV 25302	304-807-0299		gary.roberts@otis.com
WEST VIRGINIA ELEVATOR	Grant Murphy	gmurphy@ wvelevator.com	~~304-542-5265~~ 304-483-6369		gmurphy@ wvelevator.com
DC	DALE HOWARD	dale.howard@ dcelevator.com	~~859-351-9234~~		

***One Vendor Per Representative** - No one individual is permitted to represent more than one vendor at the pre-bid meeting. Any individual that does attempt to represent two or more vendors will be required to select one vendor to which the individual's attendance will be attributed. The vendors not selected will be deemed to have not attended the pre-bid meeting unless another individual attended on their behalf.*

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Centralized Request for Quote
Construction

Proc Folder: 1010703		**Reason for Modification:**
Doc Description: Elevator Modernization Various Facilities (Phase II)		Addendum No.2
Proc Type: Central Purchase Order		

Date Issued	Solicitation Closes	Solicitation No	Version
2022-08-11	2022-08-30 13:30	CRFQ 0211 GSD2300000011	3

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Customer Code:

Vendor Name :

Address :

Street :

City :

State : **Country :** **Zip :**

Principal Contact :

Vendor Contact Phone: **Extension:**

FOR INFORMATION CONTACT THE BUYER
Melissa Pettrey
(304) 558-0094
melissa.k.pettrey@wv.gov

Vendor Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

SOLICITATION NUMBER: CRFQ GSD2300000011
Addendum Number: 2

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

[ ] Modify bid opening date and time

[✓] Modify specifications of product or service being sought

[✓] Attachment of vendor questions and responses

[ ] Attachment of pre-bid sign-in sheet

[ ] Correction of error

[ ] Other

Description of Modification to Solicitation:

1. See attached for specification clarifications.
2. See attached for technical questions and answers.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.

2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

MILLER

ADDENDUM #2

Project Name: WV GSD Elevator Modernizations – Phase 2 CRFQ GSD 23-11
Date: 8/22/2022
Addendum #: 2

Clarifications:

1. Clarifying, the Building 5 executive elevator is to be referred to as Elevator #5. Any project document references to this elevator as #6 are hereby changed to read "#5".

2. In *Summary/ Narrative Scope of Work, Phasing of Modifications and Replacements - Building 5:*
   Replace the first sentence, which starts "Building 5 will have one..." **with** "In Building 5, the four passenger cars in the lobby are two pairs, with each pair sharing a shaft. Only one pair of elevators (sharing a common shaft) may be out of service for modernization at any time. One pair must achieve Substantial Completion before the other pair can be taken out of service.

   Replace the last sentence, which starts "The executive elevator (#6)..." **with** "The Executive elevator (#5) may be taken out of service independently of the schedule for modernization of the four other passenger cars, and may be out of service for a period not to exceed 120 consecutive calendar days."

3. Three drawings sheets were inadvertently omitted from the project drawing set during assembly, they are attached to this Addendum.

4. Building 17 elevator shall be a partial replacement, generally including: controls, pump, car, guide rails, buffer, entrance doors, cab doors, and signals. Note that this excludes cylinder and entrance jamb replacement. The existing wood jambs trim work will be replaced with identical wood species and stain. The existing concealed steel jamb is to remain. Specification section 14 2402 (attached) applies to this work.

5. Note that for Building 86, the top of both cars and top of the shaft at cars will be placarded with readily visible low overhead warnings. Sign language, color, size to be determined (TBD) by the Engineer in submittal. The top of car working area will be painted a safety color TBD by the Engineer.

6. Clarifying that all hydraulic elevator cylinders will use single direct acting pistons. No telescoping pistons will be used.

7. Building 15, 84, and 86 shall be full replacement, generally including: controls, pump, cylinder, pump, car, guide rails, buffer, entrance doors, cab doors, and signals. Note that this excludes the entrance jamb replacement. Specification section 14 2401 applies to this work.

8. At all locations, the existing hoistway landing header can remain if reconditioned and modified as necessary for the door operator track assembly, otherwise replace header. The cabs, including door header and operator, shall be new.

9. Clarifying, all elevator entrance doors will be new and finish will be as follows: Building 5 - Stainless Steel, Building 15 – Powder Coated, Building 17 – Powder Coated, Building 84 – Powder Coated, Building 86 – Stainless Steel

10. Clarifying, all the following stainless steel elevator entrance jambs will remain and be thoroughly cleaning and polished: Building 5 (First Floor only) and Building 86.

11. Clarifying, all the following steel elevator entrance jambs will remain and will be repaired, cleaned, prepped for, and repainted with electrostatic paint: Building 5 (All floors except First Floor), Building 15, and Building 84.

Drawings:

Add sheets G001-86, G101-86, and G601-86, attached.

Clarification on sheet note #14 of drawing Q101-05 and sheet note #2 of drawings Q102-05, Q103-05, and Q104-05: "HEADER" is referring to the existing head jamb exposed to the elevator lobby which gets repainted as part of the project.

Clarification on sheet note #2 of drawing Q101-05: "HEADER" is referring to the existing head jamb exposed to the elevator lobby which gets thoroughly cleaned and polished as part of the project.

Remove the wording "IF NEEDED," from the following sheet notes: Q101-15 note #7, Q101-84 note #9, and Q101-86 note #4.

Specifications:

Add section 14 2402 – Hydraulic Elevator Modernization (Partial), attached.

Questions:

1. **Q:** B-86 last page of prints. It appears there will be a new door going into the new mechanical room. There is a hardware set for that door. No door size is mark on the print, will you check the wall types,door size also. Same room looks like it get new walls, no wall tags, what is the height of wall?
   A: The information of concern is found in the three sheets attached to this Addendum, see Clarification #2.

2. **Q:** So far my only question would be: Would the state consider an alternative coating system in lieu of the Electrostatic Spray? We have stripped and refinished elevator doors in our shop prior to reinstalling them. This may cut down on some of the wear and tear on them while the upgrades are taking place and allow us to safely remove the lead coatings prior to spraying a multicoat system.
   A: No alternative coating system permitted. Doors are to be replaced at all locations and shall be factory finished.

3. **Q:** After speaking with multiple elevator companies, they all feel the 365 day contract time is not possible. Realistically in todays markets and circumstances we are looking at 9 months from contract date just to have the cabs available for installation. Those traction elevators take a long time to get and get approved. We would like to formally request the contract time to be 18 months at a minimum for substantial completion.

A: The 365 day contract time remains unchanged. This is based on the roughly 6 months delivery for the roped cars, the design teams' indications by many in the industry that lead times are improving, and the changes to the sequence of Building 5 found in Clarification 2 above. If the lead time is elongated, through no fault of the contractor, the Owner would entertain a contract time extension, provided that submittals are completed and equipment is ordered in a prompt manner after Notice to Proceed. To reiterate from the Narrative "Vendor will provide all necessary submittals for review within thirty (30) days after Notice to Proceed.". Vendor is encouraged to begin submittals upon receipt of a Purchase Order for the project. The Owner and Design Team reinforce the necessity of diligence by the Vendors, subcontractors, and suppliers in both the timeliness of preparation of, and in the accuracy and completeness of the submittals presented. Submission of submittals "for the record" in lieu of incomplete or inaccurate submittals will not be entertained. The Vendor will use all necessary measures, and absorb all costs, to expedite the ordering, production, and delivery of the elevator systems. Elevator orders will be placed within one day of approved submittals, this is a project requirement.

Administrative:

1. There are clarifications to Liquidated Damages within this Addendum #2. Make sure to review the Addendum in its entirety.

All herein becomes part of the scope project documents and the scope of project work. Contractor is to acknowledge this as Addendum #2 on the Bid Form.

Respectfully submitted this 22nd day of August 2022.

Craig Miller PE
President
Miller Engineering, Inc.

SECTION 14 2402

HYDRAULIC ELEVATOR MODERNIZATION (PARTIAL)

PART 1 GENERAL

1.01 GENERAL REFERENCE

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

1.02 DESCRIPTION OF WORK

A. This specification relates to the full modernization of existing hydraulic elevators. Requirements beyond this section, found elsewhere in the project documents, apply to the the work in this section.

B. Perform all required field engineering surveys and provide all engineering, labor, materials, tools, equipment, transportation, and supervision in order to design, engineer, fabricate and install the elevator plant as shown on the Drawings and listed in this Specification documents, complete in a first-class workmanship manner. All work shall be done in accordance with the requirements of all local codes and applicable regulations, which may govern the requirements of this installation.

C. The work to be performed shall include the furnishing and installation of all labor, materials and equipment as hereinafter specified. The Contractor shall provide all work to furnish a complete installation. The apparent silence of the Specifications as to any detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only the best material and workmanship is to be used; and interpretation of these Specifications shall be made upon that basis. The Engineer and the elevator consultant are the final authority on determining compliance to all requirements herein.

1.03 SUMMARY

A. This Section includes one hydraulic passenger elevator.
   1. Related work includes the following:
      a. "Fire Alarm" for smoke detectors in elevator lobbies to initiate emergency recall operation and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation and for connection to elevator controllers.
      b. "Premise Telephone Wiring" for telephone service to elevators.
      c. Mechanical and Plumbing Requirements.
      d. Electrical service for elevators to and including fused disconnect switches at machine room door and standby power source, transfer switch and connection from auxiliary contacts in transfer switch to controller.
      e. General Construction as shown on the drawings

1.04 DEFINITION

A. Defective Elevator Work
   1. Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe operation and/or conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions. In regards to defective work, the decisions of the Engineer and Elevator Consultant are final

1.05 SUBMITTALS

A. Product Data and Catalogue Information:
   1. Include capacity sizes, performances, operation, safety features, finishes and similar information.
   2. Catalogue cuts shall be provided for the following:
      a. Controller and Machine Drive
      b. Hydraulic pumping units

c. Pump motors
d. Hydraulic Valves
e. Buffers
f. Complete door operating system
g. Recommended spare parts

B. Shop Drawings:
1. Show plans elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and location of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support and maximum and average power demands. Custom engineered detail drawings to include the following:
a. Hoistway and Elevator Equipment Room Layouts- Plan and Elevation, including reactions and loads imposed on the building structure by the elevator equipment located on the elevator hoistway drawings. Hoistway and elevator equipment room layout drawings to be sealed by a Professional Engineer, licensed to do business in the State of West Virginia.
b. Car Door Operating Equipment Details
c. Electrical Requirements
d. Heat load in elevator machine room

C. Manufacturer Certificates:
1. Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on the drawings, and electrical service, including emergency generator, as shown and specified are adequate for elevator system being provided.

D. Maintenance Manuals, Keys, Certificates:
1. Include operation manuals, maintenance manuals, adjustment manuals, troubleshooting manuals, parts manuals, emergency instructions, and similar information required to properly maintain, adjust, and repair the equipment installed. Include diagnostic and repair information available to manufacturer and Installer's maintenance personnel. Submit as part of the Project close-out and prior to final payment.
2. Ten (10) sets of keys to operate all keyed operating functions, all marked and identified. Any key requiring a special blank for copying shall be identified.

E. Inspection and Acceptance Certificates and Operating Permits:
1. As required by the authorities having jurisdiction for normal, unrestricted elevator use.

1.06 QUALITY ASSURANCE

A. Standards and Regulations
1. Materials, design, clearances, construction, workmanship, operation and tests shall be in accordance with the requirements of the most recent adopted issues of the ASME/ANSI A 17.1 Safety Code for Elevators, Dumbwaiters, and Escalators, the National Electric Safety Code, the IBC/BOCA Code, the NFPA Code, and all other Codes, regulations, laws, including ADA, and ordinances as may govern. Where conflicts occur in the above codes, the most rigid shall apply. It is the duty of the elevator contractor to investigate the related Codes to ensure that the installed equipment complies with all Codes governing their work. Failure of the specification to state a specific requirement of the local authority having jurisdiction's requirements does not relieve the contractor from compliance of the various codes.
2. Equipment to be provided and installed shall be in accordance with the Seismic Zone Risk category of the project location.
3. Nothing contained in these specifications shall conflict with any Codes or federal, state or local laws, ordinances, rules or regulations governing the work.

B. Manufacturers:
1. Manufacturers shall be ones regularly engaged in the business of design, engineering and manufacturing of elevators, or elevator components, of the type and character required by

these specifications and shall manufacture the entire assembly from products of their own make, or others, and assume full responsibility for the products used in said assembly. ONLY NON-PROPRIETARY EQUIPMENT WILL BE SUPPLIED AND INSTALLED.

C. Elevator Contractors:
   1. Elevator Contractors shall be regularly engaged in the business of design, engineering, manufacturer, installation and servicing of elevators of the type and character required by these specifications, shall be or represent an approved manufacturer, and shall assume full responsibility for the products used in assembling the elevator equipment.
   2. Elevator Contractors shall be able to demonstrate elevators that they have installed of similar design and scope and shall have been in service for at least five years prior to this bid date.
   3. Elevator Contractor shall be able to show successful experience in the complete maintenance of elevators, employ competent personnel to handle the service, maintain locally an adequate supply of stock of parts for replacement or emergency and have qualified employees locally available to insure the fulfillment of the service demands of this facility without reasonable delay.
   4. Elevator Contractor shall provide a reasonable estimate of the time to respond to emergency service calls for entrapments and regular service calls for repairs.

D. Material Standards:
   1. Materials to be furnished under these specifications shall be new, shall be of the best grade and quality used for the purpose of commercial practice and shall be of the latest standard product as advertised in printed catalogues by reputable manufacturers.
      a. Aluminum Extrusions per ASTM B-221; sheet and plate per ASTM B-209.
      b. Bronze - Stretcher leveled, resquared sheets composed of 60% copper and 40% zinc similar to Muntz metal, Alloy Group 2 with #4 finish, grains of belting shall be in direction of the longest dimension.
      c. Nickel-Silver, Cooper-Nickel-Zinc Extrusions of CDA alloy C77600.
      d. Steel - Low carbon, cold rolled to stretcher leveled standard flatness per ASTM A-366 for sheet; per ASTM a-36 for structural.
      e. Satin Stainless - Type 302 or 304 with #4 finish on exposed surfaces per ASTM A-167, grains of belting shall be in the longest dimension.
      f. Polished Stainless Type 302 or 304 with #8 polished finish.
      g. Plastic Laminate - NEMA LD1, Type 1, 1/16" thick.
      h. Paint - All exposed metal work, except as otherwise noted, shall be cleaned of oil, grease, scale, and other foreign matter and receive a factory coat of manufacturer's standard rust-resistant primer applied. Paint shall be electrostatically applied.
      i. Prime Finish - All surfaces which are to receive an enamel finish shall be cleaned of oil, grease, scale, rust, etc., and have one coat of rust resistant mineral paint applied following by a filler coat over uneven surfaces, then the surface shall be sanded smooth and a final coat of mineral paint applied.
      j. Enamel Finish - All surfaces shall be primed per the preceding specification for Prime Finish and then have two (2) coats of enamel in the color selected applied.

E. Equipment Standards:
   1. Equipment to be furnished under these specifications shall be new and shall be the latest standard product as advertised in printed catalogues by reputable manufacturers. Major items of the equipment shall be of the best grade and quality used for the purpose of commercial practice and shall have the Manufacturer's name, address, and catalogue numbers on a plate securely affixed to the equipment in a conspicuous place.
   2. Equipment or apparatus of any one system must be the product of one manufacturer, or equivalent products of a number of manufacturers, which are suitable for use in a unified or assembled system. All parts of the elevator equipment shall be built to standard dimensions, tolerances and clearances in order to ensure complete interchangeability of similar parts of similar machines and devices. The mechanical fastenings used throughout the equipment on parts subject to wear and replacement shall be key and seat, nut and bolt, screw or other removable type not requiring physical deformation.

F. Accessibility Requirements
   1. In addition to local governing regulations, comply with Section 4.10 in the US Architectural & Transportation Barriers Compliance Board's "American with Disabilities Act (ADA), Accessibility Guidelines (ADAAG). And Section 407 of ANSI A117.1.

1.07 COORDINATION

A. Coordinate the installation of sleeves, blockouts, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to project site in time for installation.

B. Coordinate locations and dimensions of other work relating to elevators, including pit ladders, sumps, and floor drains in pits, entrance subsills, and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

C. Confirm power, floor designations, travel, clear overhead, pit depths, emergency recall floors, main and alternate, dispatch floor locations, etc., prior to fabrication of equipment. It is the responsibility of the elevator contractor to verify all measurements, loads, location, shown on the architectural layouts. Any deviation from the architectural drawings and/or specifications shall be identified by the elevator contactor as non-conforming and brought to the attention of the General Contractor, Architect, and elevator consultant for suggested remediation.

D. Provide engineering information as necessary to coordinate the interface work of other trades impacting the elevator work.

1.08 WARRANTY

A. Vendor will provide a written warranty and guarantee of all equipment provided and installed against defects in materials and workmanship for a period of one (1) year from the Substantial Completion of the final individual elevator system or for the standard period of the manufacturer's warranty, whichever is longer. Vendor will correct any defects not due to ordinary wear and tear or improper use or care which may develop during this equipment warranty period. This warranty is not intended to supplant normal maintenance service and shall not be construed to mean that the Vendor shall provide free service or periodic examination, lubrication, or adjustment due to normal use, beyond that included in the specifications (see Maintenance Service, below). This warranty includes all labor and material to repair and/or replace any defective or failed part within the warranty period.

1.09 MAINTENANCE SERVICE

A. Provide warranty period full coverage comprehensive preventive maintenance service commencing upon completion of the elevator and acceptance by the Owner and continuing through the twelve-month Warranty period. The maintenance service to be provided shall be all inclusive and not include any prorations or exclusions.

B. Perform preventive maintenance and service work during regular working hours of regular working days, unless specifically requested to be performed at other times by the Owner.

C. Provide emergency callback service on a 24-hour, 7 day per week basis.

D. Respond to all service requests for service during the regular working hours within one hour. Respond to all requests for service after regular working hours within two hours, regardless of the time of day or day of the week that a service call is placed.

E. Include all adjustments, lubrications, cleaning supplies and parts necessary to keep the equipment in proper operation, except such adjustments, parts or repairs made necessary by misuse or abuse.

F. Repair or replace electrical or mechanical parts of the elevator equipment, whenever required, and use only genuine parts produced by the manufacturer of the equipment concerned.

G. Perform tests of the elevator and elevator operation as often as required by the Code of the locale in which the project is located. If the authority having jurisdiction adopts no Code, all testing shall be in conformance with all tests outlined in the most recent published ASME/ANSI A17.1.

H. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts shall be produced by manufacturer of original equipment.

1.10 CONTINUING MAINTENANCE PROPOSAL

A. Upon the expiration of the twelve month Warranty and Guaranteed installation specified, the systems will be added to the Owner's standing maintenance contract maintenance period. All documentation related to warranty repairs executed during the warranty period and will be returned over to the Owner on the last day of warranty.

1.11 MAINTENANCE SERVICE AND SUPPORT

A. Notify the Owner and provide to the Owner continuing information regarding changes to be performed to the equipment to comply with manufacturer's recommended and/or authorized changes and repairs, modifications, adjustment, replacements, etc., and to perform any repairs and/or replacements of equipment components required by the component manufacturer to be made to correct faulty design or manufacturer, to permit for the continued integrity and safe operation of the equipment provided under the elevator installation contract and this specification.

B. Provide field and technical assistance and instructions to the Owner, within a reasonable time frame following the Owner's request.

C. Perform preventive maintenance and service work during regular working hours of regular working days, unless specifically requested to be performed at other times by the GSD. Regular hours during a Legislative Session are considered to be 24/7.

D. Provide any/all technical information publications, bulletins, notices, etc., which outline recommendations for changes in design and/or replacement of installed equipment for a period of ten (10) years after completion and acceptance of the installation.

PART 2 PRODUCTS - HYDRAULIC FREIGHT ELEVATOR

2.01 PRODUCTS - MANUFACTURERS

A. Subject to compliance with the requirements of the specifications and drawings, the following manufacturers are approved manufacturers for the project.
   1. Hydraulic Elevators
      a. Thyssen Krupp Elevator Company
      b. Otis Elevator Company
      c. Schindler Elevator Company
      d. Kone Inc.
      e. Canton Elevator
      f. Minnesota Elevator Company
      g. Schumacker Elevator Company
      h. G.A.L.
      i. Virginia Controls

B. Manufacturer Substitutions: See Substitutions Sections of these specifications.

2.02 ELEVATOR EQUIPMENT SUMMARY - BUILDING 17 ELEVATOR 1 (PASSENGER)

A.	QUANTITY:	Existing	One (1)
B.	TYPE:	Existing	Hydraulic Passenger (1)
C.	CAPACITY:	Existing	2100#
D.	SPEED:	Existing	125 fpm
E.	TRAVEL:	Existing	Approximately 30' 6" Contractor to verify in field
F.	STOPS:	Existing	3

G.	OPENINGS:	Existing	3 in line
H.	CONTROL:	New	Automatic w/ solid state starters
I.	OPERATION:	New	Simplex Selective Collective
J.	POWER:	Existing	208V; 3 phase; 60 cycle, contractor to verify in field
K.	PUMPING UNIT	New	Direct submersible
L.	CYLINDER	Existing	Reuse existing, test prior to demolition of existing system, leak test and full load test.
M.	MOTOR:	New	Single Speed AC
N.	CAR FRAME:	New	Steel channel car frame
O.	PLATFORM:	New	Steel platform with wood sub floor for passenger and steel support sub floor for Class C-1 loading on freight.
P.	GUIDE RAILS:	Existing / New	Replace or clean, align, and paint, contractors descretion, including verifying integrity of rail mounts and repairing as necessary, determined prior to bidding. A West Virginia PE must inspect and certified the condition of the rails and their mounts.
Q.	CAR FLOORING :	New	Rubber non-slip tile
R.	GUIDE SHOES:	New	Roller type
S.	BUFFERS:	New	Spring
T.	ENTRANCES:	Existing	U/L labeled 3' 0"w. x 7'0" h. Verify in field. Same to be refinished and painted in a color selected by GSD.
U.	DOOR PANELS:	New	Passenger: U/L labeled 3'0" w. x 7'0" h.. Verify in field. Stainless steel #4 finish. New fascia, dust.
			GAL MOVFR door operator, replace door header
V.	DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain scanner multiple beam proximity detector.
W.	CAB:	New	Standard modular steel shell with plastic laminate panels. One (1) handrail on rear wall, single speed fan, certificate frame, six(6) LED downlight island ceiling, #4 stainless return, transom, and car door, pads and buttons. Stainless toe rail at 8" AFF to match handrail profile.
X.	SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone,

		Video monitoring and communications system: "Comply with all ASME17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding. The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. "Digital car position indicator with directional arrows, fireman's jack and speaker, tamperproof fasteners, #4 stainless finish. All equipment rated for 24v, using LED lamps where provided. Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman's recall switch at main floor, fireman's jack at main floor. Provisions to be made for emergency generator, remote monitoring, top and bottom access The traveler cable will incoporate one spare conductor for each utilized conductor by type and application.
Y. OTHER:	NEW	New door headers and struts will be installed on the passenger elevator. All hall fixtures to be flush mounted.

2.01 CODE COMPLIANCE

The elevator controller shall use a microprocessor-based logic system and shall comply with all applicable elevator and electrical safety codes. The following codes are to be used as a minimum standard, follow most recent adoption if stated code varies from adopted code.

ANSI/ASME A17.1-2013

NFPA

IBC 2013

ANSI/ ASHRAE/ IES Standards 90.1-2013 (Elevator Energy Use Standard)

The elevator contractor is to be advised of the possibility of the need for hall access switches depending upon the distance measured to the car top from the top floor while the car is level with the floor below. If this distance exceeds 35", a hall access switch is to be provided.

If the distance from the rear of the cab to the rear hoistway wall exceeds 12" a railing must be installed on the car top per the ANSI A.17.1 Code. Proper overhead clearances to be observed.

2.02 ADA REQUIREMENTS

The elevator controllers shall comply with Title III of the Americans with Disabilities Act (ADA).

Leveling Accuracy - The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of .25" (12.7 mm) or better under all loading conditions up to the rated load.

Hall Lanterns - The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down.

Car Position Indicators - The controller shall have a position indicator output to drive the required position indicator which shall indicate the corresponding floor numbers as the car passes or stops at a floor. An audible signal shall sound as the position indicator changes floors.

2.03 ENVIRONMENTAL CONSIDERATIONS

Ambient temperature: 32F degrees to 104F degrees (0C degrees to 40C degrees).

Humidity: non-condensing up to 95%

2.04 DIAGNOSTICS

The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator statuses as an integral part of the controller.

2.05 INTENDED OPERATION OF CRITICAL COMPONENTS

Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

2.06 STATUS INDICATORS

Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is closed, when the door locks are closed, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection/Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. In addition, a means shall be provided to display other special or error conditions that are detected by the microprocessor.

2.07 OUT OF SERVICE TIMER: EXISTING REUSE

An out of service timer (T. 0. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while there are calls existing in the system.

2.08 DOOR OPERATION: NEW

Door protection timers shall be provided for both the opening and closing directions, which will protect the door motor and will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened, and the car removed from service.

A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.

If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during the nudging operation.

2.09 CAR AND HALL CALL REGISTRATION: EXISTING

Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire are not acceptable.

2.10 FIRE SERVICE OPERATION: NEW CONFORM TO ANSI A 17.1-2013 CODE

Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to applicable local codes.

The elevator control system shall be tied in with the Fire Alarm system and tested with the Fire Alarm system contractor.

Activation of the Phase 1 recall shall automatically turn on a riser of lighting within the elevator hoistway. Lighting supplied shall have illumination of at least 1 foot-candle measure from the top of the elevator cab anywhere within the hoistway.

2.11 INDEPENDENT SERVICE: NEW

Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call push-button or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

2.12 SIMPLEX SELECTIVE COLLECTIVE OPERATION: NEW

Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call pushbuttons shall cause the car to start and run automatically, provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which car or hall calls set for the direction of travel are reached, regardless of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls.

2.13 SIMPLEX HOME LANDING OPERATION: NEW

If no calls are registered, this operation shall cause the car to travel to a predetermined home landing floor and stop without door operation. If the car is en route to the home landing and a

call appears from the opposite direction, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed nonstop in response to any normal call.

2.14 LEVELING: NEW

The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

2.15 ELEVATOR LANDING SYSTEM: NEW

The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors and magnetic strips for stepping, leveling and optional floor encoding.

2.16 TEST SWITCH: NEW

A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

2.17 RELAY PANEL INSPECTION: NEW

A relay panel inspection switch and an up/down switch shall be provided in the controller to place the elevator on inspection operation and allow the user to move the car in the hoistway. The car top inspection switch shall render the relay panel inspection switch inoperative.

2.18 UNCANCELED CALL BYPASS: NEW

A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the defective call and continue to provide service in the building.

2.19 ANTI-NUISANCE (PHOTO-EYE): NEW

The controller computer shall cancel all remaining car calls, if an adjustable number of car calls are answered without the computer detecting a photo eye input.

2.20 ON-BOARD DIAGNOSTICS: NEW

The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using non-volatile memory. The microprocessor board shall provide the features listed below.

On-board diagnostic switches and an alphanumeric display shall provide user-friendly interaction between the mechanic and the controller.

On-board real time clock shall display the time and date and is adjustable by means of on-board switches.

Field programmability of specific timer values (i.e., door times, MG shutdown time, etc.) may be viewed and/or altered through use of the on-board switches and pushbuttons.

2.21 OPTIONAL PERIPHERALS: NEW

As an integral part of the controller, the capability shall be provided to attach on-site or remote computer peripherals, yielding additional adjustment or diagnostic capabilities.

The elevator shall not require the functioning or presence of the microprocessor to operate on car top inspection or hoistway access operation to provide a reliable means of moving the car if the microprocessor fails.

A motor limit timer function shall be provided which, in case of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing and park, open the doors automatically and then close them. Car calls shall be canceled, and the car taken out of service automatically. Operation may be restored by cycling the main line

disconnect switch or putting the car on access or inspection operation. Door reopening devices shall remain operative.

A valve limit timer shall be provided which shall automatically cut off current to the down valve solenoids if they have been energized longer than a predetermined time. The car calls shall then be canceled, and the car taken out of service automatically. Operation may be restored by cycling the main line disconnect switch or putting the car on access or inspection operation. Door reopening devices shall remain operative.

A selector switch shall be provided on the controller to select high or low speed during access or inspection operation as long as contract speed does not exceed 150 feet per minute.

Viscosity control shall cause the car to accomplish the following operation. If a temperature sensor determines the oil is too cold, and if there are no calls registered, the car shall go to the bottom landing and, as long as the doors are closed, the pump motor shall run without the valve coils energized to circulate and heat the oil to the desired temperature. In the event that the temperature sensor fails, a timer shall prevent continuous running of the pump motor.

In the event of a power failure a battery lowering device pre-wired, pre-tested and integrated into the standard enclosure shall be provided. Provisions shall also be made for emergency generator.

A solid-state starter shall be provided, and it will be mounted within the controller enclosure.

Provisions to be made to interface this elevator with the new Lift Net system, or approved equal.

2.22 PROGRAMMABLE LOGIC: NEW

All available programming options or parameters shall be field programmable, without need for any external device or knowledge of any programming languages. Programmable options and parameters shall be stored in nonvolatile memory. As a minimum, there shall be a 32-character alphanumeric display used for programming and diagnostics. Programmable parameters and options shall include, but are not limited to, the following:

Number of Stops/Openings Served (Each Car)

Simplex/Duplex

Single Automatic Pushbutton

Selective Collective/Single Button Collective

Programmable Fire Code Options/Fire Floors (Main, Alternates)

Floor Encoding (Absolute PI)

Digital PIs/Single Wire PI's

Programmable Door Times

Programmable Motor Limit Timer

Nudging

External Car Shutdown Input (e.g., battery lowering device)

External Low Oil Sensor Input

External Viscosity Control Input

Parking Floors

Hall or Car Gong Selection

Retiring Cam Option for Freight Doors

Independent Rear Doors

Standard Security

Emergency Hospital Service

Attendant Service

Anti-nuisance - Light Load Weighing and Photo Eye

Hall Access switches

The dispatching algorithm for assigning hall calls shall be real time, based on estimated time of arrival (ETA). In calculating the estimated time of arrival for each elevator, the dispatcher shall consider, but not be limited to, the location of the elevator, the direction of travel, the existing hall call and car call demands, the door time, flight time, lobby removal time penalty and coincidence calls.

The controller shall have field programmable outputs to activate different functions based on customer needs. These functions can be outputs as listed below.

Fire Phase I Return Complete Signal

Fire Phase II Output Signal

Hall Call Reject Signal

Emergency Power Return Complete

The controller shall have field programmable inputs to initiate special operations based on customer needs. These functions can be inputs as listed below.

Fire Phase I Bypass Input

Fire Phase II Call Cancel Input

Fire Phase II Hold Input

Attendant Service Input

Building Security Input

Hospital Emergency Operation Input

Hoistway Access

The controller shall include absolute floor encoding, which upon power up, shall move the car to the closest floor to identify the position of the elevator.

The controller shall have a serial port for communication with a data or computer terminal such as a CRT terminal, modem or CMS remote monitoring.

2.23 TOP OF CAR INSPECTION STATION, PIT SWITCH: EXISTING REUSE

An inspection and maintenance control station shall be mounted on top of the elevator car. This station shall contain Up and Down direction buttons and an emergency stop switch, 110v GFI duplex receptacles, work light with shield, and an audible and visual signal to comply with Fireman/Emergency control requirements. When the car is on inspection mode, it shall operate at a reduced speed by constant pressure on the appropriate direction of travel button. Provision shall be made to make normal operating devices inoperative while the car top operating device is in use. A toggle switch in the control operating panel shall operate a switch on the elevator equipment room controller to place the station in and out of service.

A stop switch shall be provided in each elevator pit and be located adjacent to the pit access door or access ladder in accordance with ASME A17.1 requirements.

2.24 PIT LIGHT AND GFI RECEPTACLE: EXISTING REUSE

A pit light switch shall be provided for each car located at the proper height within the hoistway in accordance with ASME A17.1 requirements. The pit light device will have a guard to protect the LED light bulb from damage.

A GFI duplex receptacle shall be installed in each elevator pit.

A metal pit ladder shall be installed in each elevator pit and shall extend 48" above the finish floor of the lowest landing. Location and installation of this device will be in accordance with ANSI A17.1-2013 requirements.

2.25 SIGNALS AND OPERATING FIXTURES: EXISTING REUSE

The signal and operating fixtures shall be reused. Contractor shall verify that each elevator shall have a car operating panel, located in the return panel of the car enclosure. The car

operating panel shall contain a series of car operating buttons with integral knowledge light illumination corresponding to the landings served, a keyed emergency stop switch, an alarm bell button with jewel, a Door Open button, a Door close button. The car operating panel shall include a fireman emergency operation key switch, jewel and call cancel button. Pressure upon a car call button shall cause the button to illuminate. When the car stops in response to this car call, the call shall be canceled, and the button illumination extinguished. Plates containing raised numerals and braille indications shall be mounted flush adjacent to each floor button and also the door open and door close buttons, and the alarm bell in the car operating panel.

Control and service switches, integral with car operating panel, shall include a keyed independent service switch, inspection key switch, keyed light switch, keyed fan switch, emergency light test switch, two (2) additional spare switch modules left blank for future use, and other control operating devices required to meet the requirements of the specification and/or Code. Adjustable volume electronic toners shall provide audible signaling of floor passing and car stop, and adjustable volume buzzers shall signal door delay and fireman emergency.

A hands-free telephone and wiring from the telephone to terminals on the elevator controller, shall be provided in the car-operating panel. Others shall provide telephone wiring to the machine room controller location. The hands-free telephone shall be integral with the car operating panel and include instructions for use, a pushbutton to initiate the call, a microphone transmitter, a speaker and an acknowledge light to indicate when the call has been answered. The operation of the telephone shall automatically signal call acknowledgment and automatically reset on calls termination and not require any special action on the part of the operator. The telephone shall have the capability for ring-down use with an in-house telephone system or operate with a standard dial tone.

An LED digital readout position indicator shall be provided in each car operating panel, to indicate the position of the car in the hoistway and include arrows to indicate the direction of travel of the car. The readouts shall be approximately 1.5" high.

A directional lantern with adjustable electronic toners shall be provided at each entrance at each floor. Directional lanterns shall signal once if a car is traveling in the Up direction and twice if in the Down direction and signal waiting passengers of the arrival of the next elevator and direction of travel.

An LED position indicator with direction of travel arrows shall be mounted integral with the hall lantern at each floor identified in the Equipment Summary. The numerals and the arrow shall be illuminated with sufficient intensity to permit easy reading of the indicator. The readouts shall be approximately 2" high.

Landing pushbutton fixtures containing Up and/or Down pushbuttons shall be provided at each floor. Illumination shall be provided in each button which shall light upon pressure registration of a call at that landing and be extinguished when a car responds to that call. Provide quality as listed in the Elevator Summary/Equipment Schedule. Pushbutton fixtures to be mounted at the recommended height for ADA requirements. Prior cutouts and/or boxes for existing hall stations can be utilized for extender type hall stations to meet this requirement. If extender type hall station fixtures are not utilized, the existing hall station cutout shall be filled, and the wall surface finished matching the existing wall covering. No cover plates will be allowed. Include firesafing of all wall penetrations.

A Fireman/Emergency Operation key switch shall be located at the primary Fireman access floor elevator lobby and in the Fire Command Center to permit elevators to be recalled manually via operation of that key switch. The operation of the system and the location of the key switch will be determined by local Code requirements. The primary Fireman access floor and alternative floor shall be confirmed prior to fabricating the control or installing the key switch station.

All fixture faceplates shall be a minimum of 1/8" thick with a natural #4 brushed finish. All edges to be beveled on all sides of the faceplate. All finish grains to run in the longest direction of the plate.

The car station shall contain an emergency light fixture and power supply to operate it and the alarm bell in the event of loss of normal power.

All car and hall stations to conform to the ASME A17.1-2013 Code for proper engraving and signage. All hall stations to be engraved with the "In Case of Fire" pictogram as designated in ASME A17.1-2013 Figure 2.27.9.

All signal devices will also conform to the latest ADA requirements

2.26 POWER UNIT: NEW

A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit consisting of the following items:
   1. Oil reservoir with tank cover and controller compartment with cover.
   2. An oil hydraulic pump.
   3. An electric motor.
   4. Oil control unit with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and magnetic controller.

B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.

C. Drive: Drive shall be by direct coupling with the pump and motor connected by multiple V-belts and sheaves of number and size to insure maximum factor of safety. Drive type shall be determined based primarily on the load on the car, travel, and speed.

D. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating shall comply with specified speeds and loads.

E. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
   1. Relief valve shall be externally adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
   2. Up start and stop valve shall be externally adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.
   3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
   4. Lowering valve and leveling valve shall be externally adjustable for drop-away speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling when slowdown is initiated.
   5. Manufacturer of the pumping unit to provide their perspective on using biodegradable fluids for their equipment. Contractor to provide cost to provide same as an alternate to be considered by GSD.

2.27 JACK UNIT: EXISTING REUSE, NEW PACKING

The existing jack units will be reused. Contractor shall test jack to insure adequate strength and freedom from leakage. New packing shall be installed.

2.28 MACHINE LOCATION

The Elevator Contractor shall survey the existing machine room location for size and accessibility. The Elevator Contractor shall submit a drawing of the new machine room showing the location of the new equipment installed and this drawing shall be signed and sealed by a registered engineer of the State of West Virginia. A sign shall be placed in the elevator machine room indicating the strength of the floor as detailed in ANSI A17.1, Rule 2.1.3.3.

2.29 CAR FRAME AND SAFETY: EXISTING, REUSE

The existing car frame and safety shall be reused.

2.30 GUIDE RAILS: EXISTING REUSE

The existing guide rails shall be reused. Contractor to verify proper bracket, spacing and channel backing will be provided.

2.31 ROLLER GUIDES/SLIDE GUIDES: EXISTING REUSE

The existing guide shoes shall be reused.

2.32 BUFFER SPRINGS: EXISTING REUSE

The existing buffer assemblies shall be reused. Contractor to verify buffer assemblies installed at the proper height to allow for suitable compression and to maintain sufficient clearances for run-by as required by Code.

Data plates shall be affixed as required by Code.

Buffers and buffer mounting channels, stands and platforms shall be painted with rust inhibiting paint.

2.33 HOISTWAY ENTRANCES: EXISTING REUSE

A. Doors and Frames: The existing door frames will be reused.

B. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.

C. Door Hanger and Tracks: Provide sheave type two-point suspension hangers and tracks for each hoistway sliding door as required for proper door operation.
   1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
   2. Hangers: Provide an adjustable slide to accommodate the up thrust of the doors.
   3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

D. Hoistway Sills: To be reused, cleaned and refinished.

Fire stops shall be provided on each panel. Floor numbers will be painted six (6) Inches high on the inside of each respective floor door panel.

Floor identification jamb plates shall be provided on each side of each entrance frame at 60 inches above the finished floor line. Each plate shall be a minimum of four (4) inches square, black background with stainless steel characters.

2.34 DOOR OPERATOR: NEW

A. A motor driven heavy-duty door operator with closed loop control system and all electronic and digital operation shall be provided. The door operator shall be mounted on the car top and shall open and close at the car door and hatch door simultaneously at any landing through the use of roller release assemblies and clutch assemblies.

B. The closed loop control shall give constant feedback on position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based upon the position and load of the door. The operator will be adjusted by using a hand-held keypad programmer where adjustment will be stored in the keypad and downloaded to another operator.

C. The operator shall contain test switches for open, close, nudging and speed zone set-up.

D. The control box housing of the electronic components for the operator will be made of material and seals to be water-resistant.

2.35 PROXIMITY EDGE: NEW

A stationary proximity 3D detector shall be installed on the car door between the leading edge of the car door and the landing door. The detector shall include a full curtain array of LED lightrays to fully cover the entire opening and be so arranged that, should an obstruction cross the plane of the array of beams, the car doors shall automatically reverse to the open position. Upon reopening, the doors shall remain open for a predetermined amount of time or stay open until the obstruction is cleared. If the obstruction remains in the path of the car door for an adjustable period of time, an adjustable volume buzzer shall continuously sound until the doors are released and allowed to fully close at a reduced rate of speed less than 2 ½ foot pounds.

2.36 ELEVATOR CAB ENCLOSURE: NEW

The existing cab enclosure will be replaced.

2.37 ELECTRIC WIRING: NEW

New wiring and conduit and wiring troughs to be installed on this installation. All wiring shall conform to the latest edition of the NEC Code.

Each traveling cable shall include a minimum of three (3) pairs of twisted shielded wires for use by a building security and/or communication system, one (1) coax cable, two CAT 6 cable, and any other special wiring as may be required to accommodate telephone, security, and fire requirements.. All travelling cables shall be rated for elevator duty.

A minimum of fifty (50) percent spares shall be provided for all traveling cables and hoistway cables.

An emergency alarm bell shall be installed on the car top, and outside the hoistway at the lowest landing.

All interlock wiring shall be Teflon insulated, or as required by Code.

New main line disconnects shall be installed as part of this contract by a licensed electrician with a master's electrician's license. These disconnects shall be located on the lock side of the machine room door and within sight of all equipment.

New 110 v. single-phase lighting disconnects shall be installed next to the new main line disconnects. The disconnect shall be lockable and installed according to the latest NEC code.

2.38 PAINTING

The elevator equipment room floor and pit floor shall be painted with two coats of deck enamel, after final adjusting. Refuge space on car top and in pit shall be painted a contrasting color.

All exposed ferrous metal surfaces of machines, motors, controllers, and any other equipment installed or retained, shall receive a coat of rust inhibiting paint. After installation, the equipment shall receive a final coat of paint.

The existing door frames of both elevators shall be sanded and filled and receive a coat of primer and paint applied electrostatically and not painted by hand.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine elevator areas for compliance with requirements for installation tolerances and other conditions affecting performance and/or compliance with these specifications. Examine hoistway, hoistway openings, pits, and machine rooms as constructed: verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PROJECT MANAGEMENT AND SUPERVISION

A. Designate an experienced Project Manager to perform the administrative management of this project and place a competent Superintendent in charge of the project throughout the course of the work. Assign an on-site job Foreman to be responsible for day to day operations and

scheduling with the Owner. Make available the Project Manager and Superintendent to assist in the progress and coordination of the work of the project in all matters relating to the project.

3.03 MATERIALS

A. Coordinate with the Owner for suitable storage of all materials, road boxes, and tools. Contractor to maintain insurance for all tools and equipment and shall be responsible for the safe keeping of it.

B. Protect equipment and exposed finishes during transportation, erection, and construction against damage.

3.04 HOISTING, HANDLING AND INSTALLATION OF EQUIPMENT

A. Install all equipment according to manufacturer's recommendations.

B. Install all equipment with proper clearances complying with referenced and applicable codes and specifications.

C. Install all items so that they are safely accessible for maintenance and so that they may be removable via portable hoist or other means for maintenance and repair.

D. Contractor shall be responsible for all hoisting of all equipment involved in this installation.

3.05 TESTS

A. A full load acceptance test will be performed upon completion.

B. The elevator will be inspected by the Department of Labor of West Virginia certified Q.E.I. inspector and/or by a qualified Q.E.I. as designated by the Department of General Services, prior to acceptance and turning the elevator over to building service.

C. All tests shall conform to ANSI A17.1 §8.10.2 and 8.10.3 with appropriate documentation as to tags and records outlined in this code.

3.06 DEMONSTRATION AND INSTRUCTION TO OWNER

A. Demonstrate operation of elevators to Owner's personnel, and designees, and provide instructions in the proper use, operation and daily maintenance of the elevators.

B. Review emergency procedures for entrapments with the Owner's representative, and designees. Train Owner's representative, and designees, in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner and designees on requirements and checklists to complete an elevator maintenance program.

3.07 SPECIAL TOOLS AND INSTRUCTIONS AND TOOL MAINTENANCE

A. Upon completion of the project, provide one (1) set of any diagnostic tools and computers, including all manuals, codes, passwords, accessories and sundries necessary to operate the diagnostic tools and computers, in order to test, adjust, maintain and troubleshoot the elevator equipment provided and for diagnostic evaluations and system monitoring. Instructions shall be provided for the operation of the diagnostic tools and computers and for all functions relating to testing, adjusting and maintenance. Diagnostic tools and computers provided to the GSD shall be capable of performing all levels of diagnostic; systems adjustments and software program changes which are available to the Elevator Contractor.

B. Provide to the Owner periodic update, maintenance, recalibration and/or reinitiating of diagnostic tools, computers and accessories upon request from the Owner, for a period of ten (10) years from the date of final acceptance of the elevator, regardless of whether the Elevator Contractor is the maintenance contractor for the elevator. Provide the Owner with a loaner diagnostic tool or computer at no cost to the , should the Owner's tool or computer be required to be replaced, recalibrated or reinitiated, until the Owner's original tool or computer is returned.

C. Provide to Owner three (3) bound sets of printed instructions for use of any tool or computer that may be necessary to perform diagnostic evaluations, system adjustment, maintenance troubleshooting and/or programmable software changes on any unit of the control equipment,

including access codes, passwords and other information necessary to interface with microprocessor control equipment. In addition, provide step by step adjusting, programming and troubleshooting procedures and a composite listing of the individual settings chosen for the variable software parameters stored on the software programs of motion and dispatch controller and motor drives.

D. Provide field and technical assistance and instructions to the Owner, upon, within a reasonable time following the Owner's request. Provide field and technical assistance and instructions to the Owner, upon, within a reasonable time following the Owner's request.

E. Provide to the Owner all field engineering bulletins, technical information publications, software upgrades or changes, issued by any manufacturer used on this installation for a period of ten (10) years after acceptance.

3.08 REFERENCE MAINTENANCE CHECKLIST

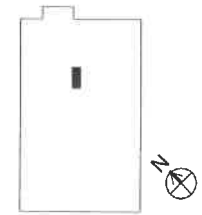
A. Elevator Maintenance Checklist

1. Inside The Car
   Sweep clean door guides & channels ensure smooth operation of door movement.
   Inspect car interior for ceiling, wall and handrail damage or lose mountings.
   Inspect all light functions and replace bulbs.
   Test Emergency Stop button for functionality.
   Confirm emergency phone is functioning and audible speakers are working clearly.
2. Outside the Car
   Replace any lights that are not functioning.
   Inspect the door panels and clearances as well as Hoist way doors.
   Check floor of car to remain flush with landing not exceeding ½" variance.
3. Machine Room
   Check lubrication schedules and levels and top off as necessary.
   Check for frayed cables running full length of car travel to all floors.
   Electrical inspection tighten all connections, observe loose connections.
   Visually inspect for any wiring discoloration or evidence of overheating.
   Hydraulics fluid level and potential leaks visual inspection.
4. Pit Inspection
   Inspect Car Buffer for oil leakage or spring over compression for car and counterweights.
   Clean out and sweep floor.
   Inspect sump and pump operation for unrestricted flow.
5. Top of Car
   Ensure the emergency hatch is functional and easily accessible.
   Test the brakes and inspect shoes, no signs of shavings or metal dust.
   Inspect the pit for proper clearances.
   Inspect the car frame for any signs of damage or cracks in welded joints.
6. Any other requirements by the manufacturer related to monthly maintenance, required in the manufacturer's I,O,M Manual will be added to the above.
7. Notes: _____
   _____
   _____
8. TECHNICIAN: _____
9. Owner acceptance: _____

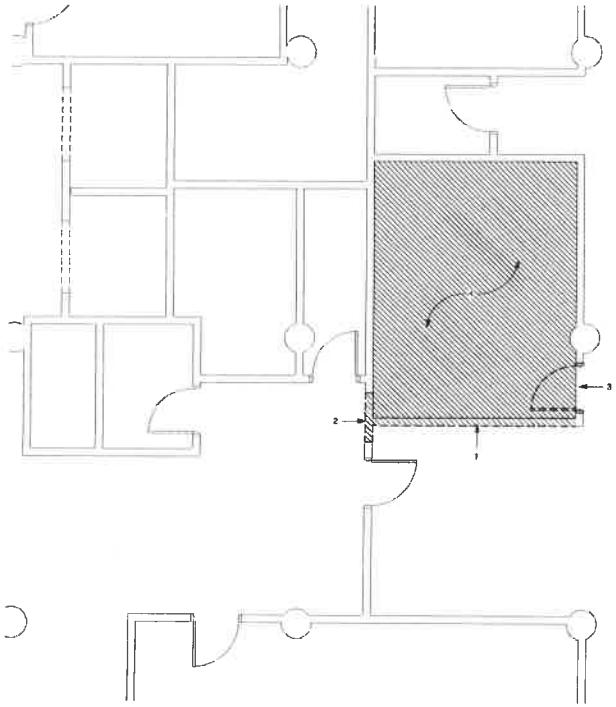
END OF SECTION

DEMOLITION PLAN NOTES
KEYNOTES:
1. REMOVE WALL.
2. CUT OPENING IN EXISTING WALL FOR NEW DOOR.
3. REMOVE DOOR AND PREP FOR IN-FILL WALL. RETAIN DOOR PANEL, FRAME, AND HARDWARE FOR RE-USE OR TURN OVER TO OWNER.
4. REMOVE CARPET TILE FLOORING.
5. REMOVE ACOUSTICAL TILE CEILING.

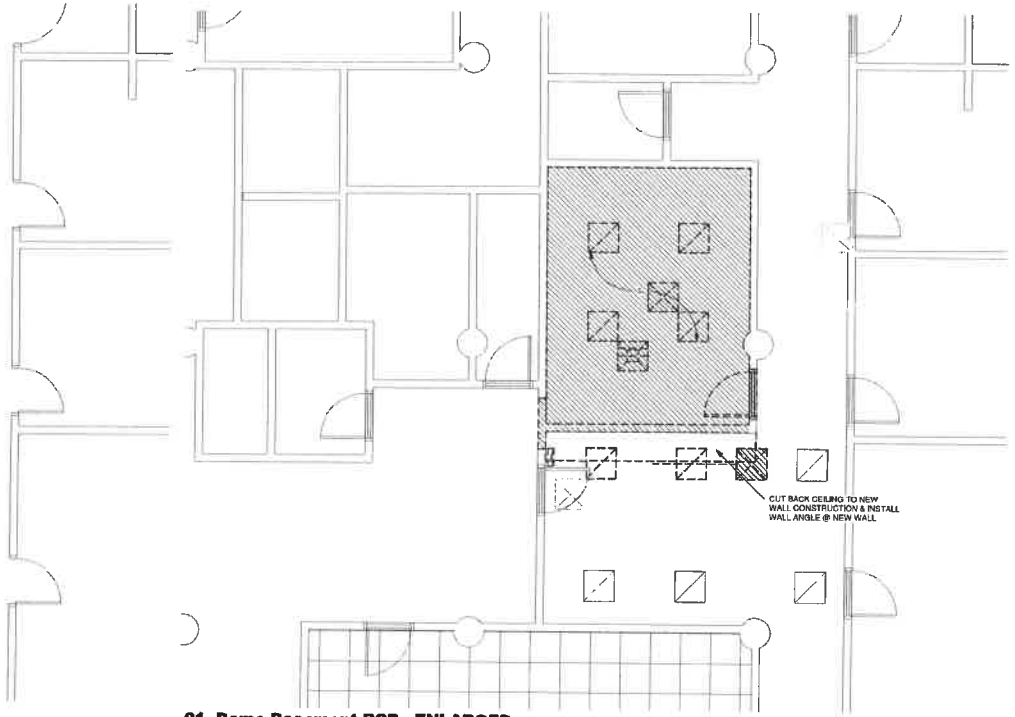
GENERAL NOTES
1. SEE MEP PLANS FOR ADDITIONAL DEMOLITION REQUIREMENTS.
2. COORDINATE DEMOLITION WORK WITH CONTINUED OPERATIONS OF THE OWNER.
3. PROTECT OCCUPIED AREAS AND ROOMS UNAFFECTED BY THE CONSTRUCTION FROM DUST, FUMES, ETC.



KEY PLAN
N.T.S.



2 **01 -Demo Basemnet Plan - ENLARGED**
1/4" = 1'-0"



1 **01 -Demo Basement RCP - ENLARGED**
1/4" = 1'-0"

MILLER

WV OFFICE:
[redacted]

PA OFFICE:
[redacted]

CONSULTANT:
Montum

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2) B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICE DIVISION

PROJECT STATUS:
CONSTRUCTION DOCUMENTS

NO	DESCRIPTION	DATE

PROJECT NUMBER:	19008
ORIGINAL PAGE SIZE:	22x34
DESIGNED BY:	TFP
DRAWN BY:	JAH, TFP
CHECKED BY:	BCM

SHEET NAME:
BUILDING #86 - GENERAL TRADES DEMOLITION

G001-86

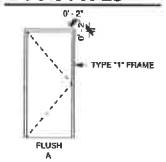
GENERAL FLOOR PLAN NOTES

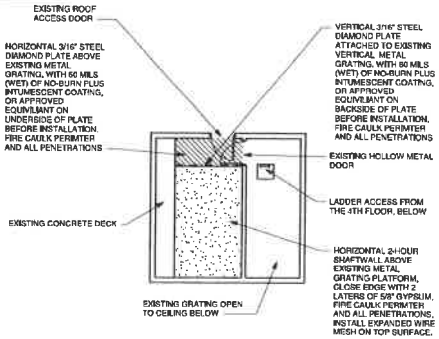
1. PROVIDE A THROUGH-PENETRATION FIRESTOP SYSTEM AT EVERY PENETRATION OF FIRE RESISTANT RATED CONSTRUCTION. COORDINATE WITH MEP AND OTHER SYSTEM DRAWINGS.
2. DIMENSIONS SHALL SUPERSEDE DRAWINGS. DO NOT SCALE DRAWINGS. WHERE A MISSING OR CONFLICTING DIMENSION OCCURS, THE ARCHITECT SHALL BE CONTACTED IMMEDIATELY TO OBTAIN THE NECESSARY CLARIFICATION.
3. ALL DIMENSIONS OF MASONRY WALLS ASSUME ACTUAL DIMENSIONS OF MASONRY UNITS. ALL DIMENSIONS TO GYPSUM BOARD AND STUD PARTITIONS ARE TO THE FACE OF THE GYPSUM BOARD.
4. REFER TO G601 FOR PARTITION TYPES.
5. ALL DRYWALL ON INTERIOR SIDE OF EXTERIOR WALLS TO EXTEND 6" ABOVE CEILING.
6. APPLY XYPEX CONCENTRATE (OR SIMILAR) BASE COAT AND XYPEX MODIFIED (OR SIMILAR) TOP COAT ON VERTICAL AND HORIZONTAL SURFACES IN EXISTING ELEVATOR PITS BELOW THE BOTTOM FLOOR LEVEL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
7. INSTALL RETROFIT WATERSTOPS AT PATCHED CONCRETE WITHIN ELEVATOR PITS.

DOOR SCHEDULE

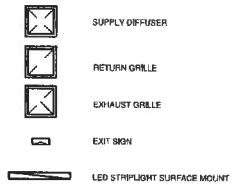
#	FIRE RATING	WIDTH	HEIGHT	PANEL TYPE	PANEL MATL	FRAME TYPE	FRAME MATL	NOTES	#
1	90 MIN	3' - 0"	7' - 0"	A	HM	1	HM		1

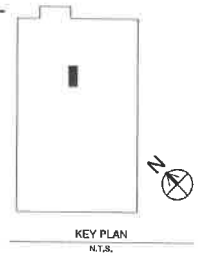
DOOR TYPES



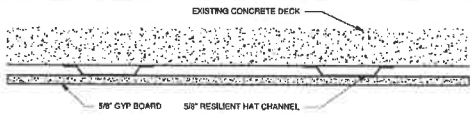


REFLECTED CEILING LEGEND



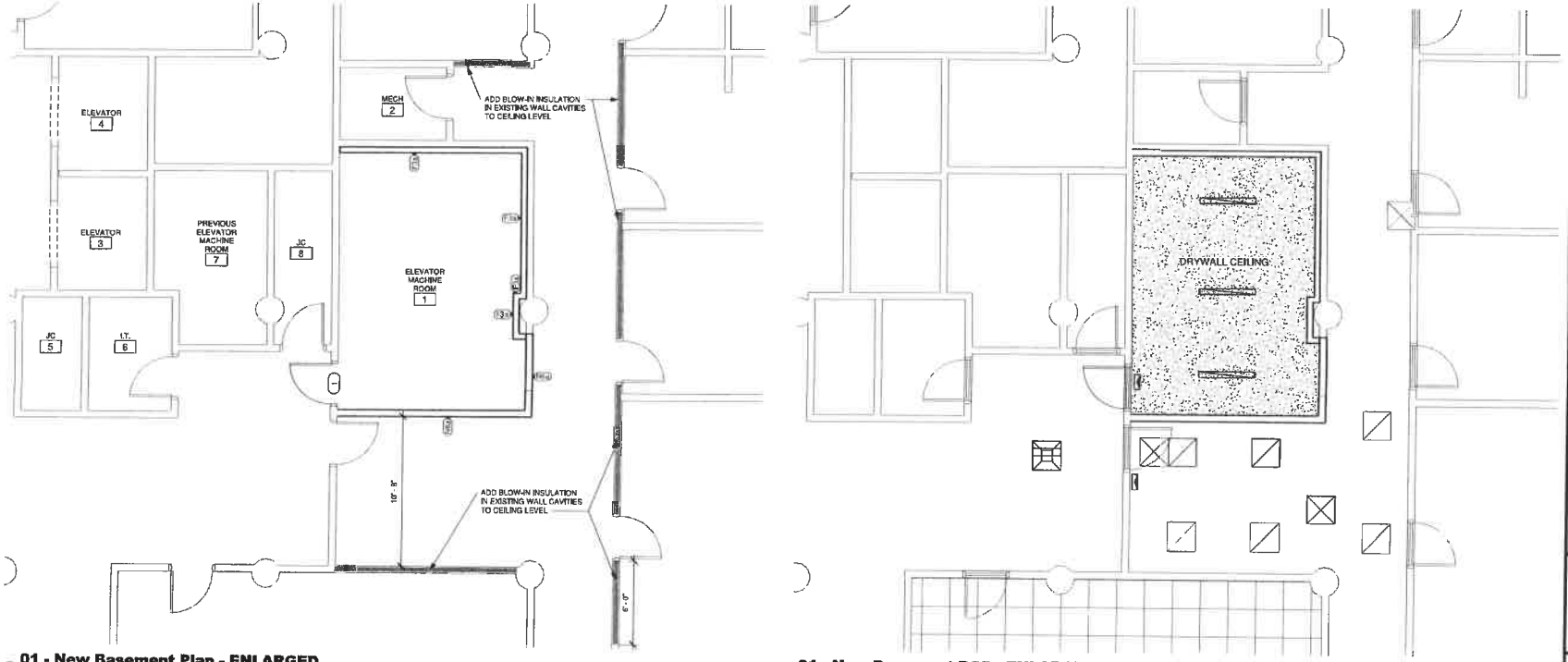


DRYWALL CEILING FRAMING DETAIL



4 PENTHOUSE FLOOR PLAN

1/8" = 1'-0"



1 01 - New Basement Plan - ENLARGED

1/4" = 1'-0"

2 01 - New Basement RCP - ENLARGED

1/4" = 1'-0"

MILLER

WV OFFICE: 51 WEST 7TH ROAD MORGANTOWN, WV 26505 PH: (304) 291-2954

PA OFFICE: 329 LEWIS RUN ROAD CARNEGIE, PA 15106 PH: (724) 695-2916

CONSULTANT: Montum

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2)
B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICE DIVISION

PROJECT STATUS:
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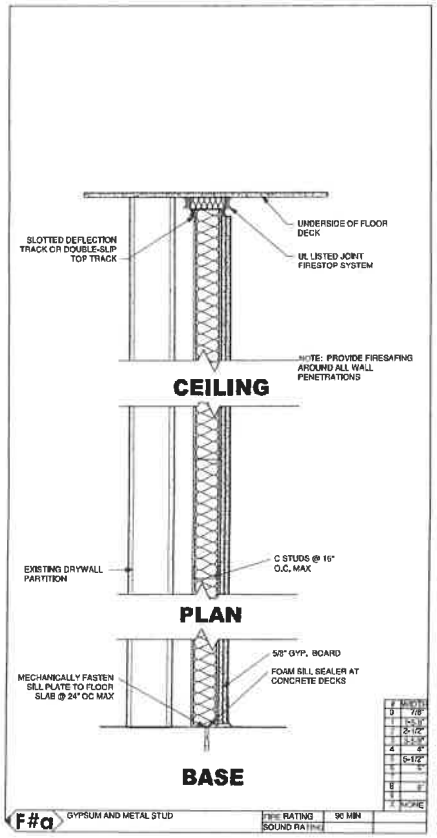
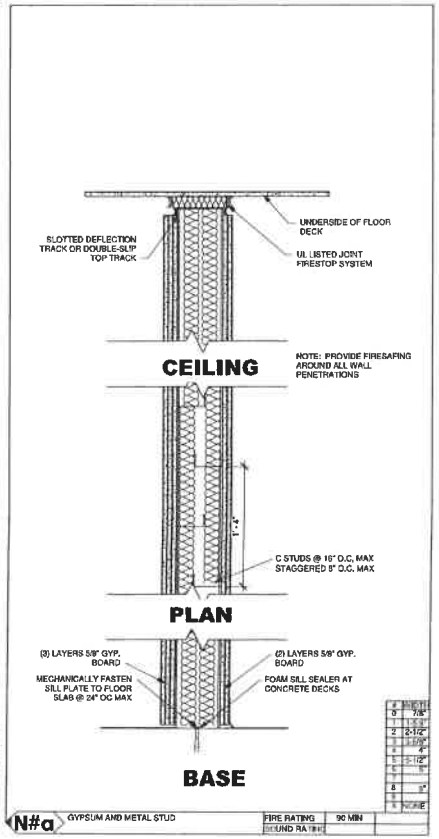
CHECKED BY:	BCM

SHEET NAME:
BUILDING #86 - GENERAL TRADES

G101-86





MILLER

CONSULTANT:
Montum Architecture

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2)
B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICE DIVISION

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SHEET NAME:
BUILDING #86 - GENERAL TRADES PARTITION SCHEDULE

G601-86

ADDENDUM ACKNOWLEDGEMENT FORM

SOLICITATION NO.: CRFQ GSD2300000011

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification. Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

- [x] Addendum No. 1
- [x] Addendum No. 2
- [ ] Addendum No. 3
- [ ] Addendum No. 4
- [ ] Addendum No. 5
- [ ] Addendum No. 6
- [ ] Addendum No. 7
- [ ] Addendum No. 8
- [ ] Addendum No. 9
- [ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

SQP Construction Group Inc.

Company

President

Authorized Signature

August 30, 2022

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

Exhibit A Pricing Page

State of West Virginia – General Services Division – Elevator Modernizations Various Facilities (Phase 2)

Name of Bidder:

SQP Construction Group Inc.

The Bidder, being familiar with and understanding the Bidding Documents and also having examined the site and being familiar with all local conditions affecting the project hereby proposes to furnish all labor, material, equipment, supplies and transportation and to perform all Work in accordance with the Bidding Documents within the time set forth for the sum of:

Base Bid – Building 5

$ 4,426,200.00 (A) **(Commodity Line 1 in wvOASIS)**

Four Million Four Hundred Twenty Six Thousand Two Hundred Dollars

(Show amount in both words and numbers)

Base Bid – Building 15

$ 502,900.00 (B)**(Commodity Line 2 in wvOasis)**

Five Hundred Two Thousand Nine Hundred Dollars

(Show amount in both words and numbers)

Base Bid – Building 17

$ 488,450.00 (C)**(Commodity Line 3 in wvOasis)**

Four Hundred Eighty Eight Thousand Four Hundred Fifty Dollars

(Show amount in both words and numbers)

Base Bid – Building 84

$ 543,600.00 (D)**(Commodity Line 4 in wvOasis)**

Five Hundred Forty Three Thousand Six Hundred Dollars

(Show amount in both words and numbers)

Base Bid – Building 86

$ 1,030,000.00 (E)**(Commodity Line 5 in wvOasis)**

One Million Thirty Thousand Dollars

(Show amount in both words and numbers)

Total Bid Amount – All Buildings (A+B+C+D+E)

$ 6,991,150.00

Six Million Nine Hundred Ninety One Thousand One Hundred Fifty Dollars

(Show amount in both words and numbers)

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

MILLER ENGINEERING, INC.

WEST VIRGINIA OFFICE
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PHONE: (304) 291 - 2234

PENNSYLVANIA OFFICE
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PHONE: (724) 966 - 5655

BUILDING #5 - SHEET LIST

NO	SHEET NAME
GENERAL	
G000-05	BUILDING #5 - GENERAL BUILDING LAYOUT
MECHANICAL	
M000-05	BUILDING #5 - MECHANICAL ABBREVIATIONS
M101-05	BUILDING #5 - MECHANICAL PLANS
ELECTRICAL	
E000-05	BUILDING #5 - ELECTRICAL ABBREVIATIONS
E001-05	BUILDING #5 - ELECTRICAL DEMOLITION PLANS
E101-05	BUILDING #5 - NEW ELECTRICAL PLANS
E102-05	BUILDING #5 - NEW ELECTRICAL PLANS
E103-05	BUILDING #5 - NEW ELECTRICAL PLANS
E104-05	BUILDING #5 - NEW ELECTRICAL PLANS
E105-05	BUILDING #5 - NEW ELECTRICAL PLANS
E501-05	BUILDING #5 - ELECTRICAL DETAILS
PLUMBING	
P000-05	BUILDING #5 - PLUMBING ABBREVIATIONS
P101-05	BUILDING #5 - DEMOLITION & NEW PLUMBING PLANS
FIRE PROTECTION	
F101-05	BUILDING #5 - NEW FIRE PROTECTION PLANS
EQUIPMENT	
Q001-05	BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q002-05	BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q003-05	BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q004-05	BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q005-05	BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q101-05	BUILDING #5 - ELEVATOR EQUIPMENT PLANS
Q102-05	BUILDING #5 - ELEVATOR EQUIPMENT PLANS
Q103-05	BUILDING #5 - ELEVATOR EQUIPMENT PLANS
Q104-05	BUILDING #5 - ELEVATOR EQUIPMENT PLANS
Q105-05	BUILDING #5 - ELEVATOR EQUIPMENT PLANS

BUILDING #15 - SHEET LIST

NO.	SHEET NAME
GENERAL	
G000-15	BUILDING #15 - GENERAL BUILDING LAYOUT
MECHANICAL	
M000-15	BUILDING #15 - MECHANICAL ABBREVIATIONS
M101-15	BUILDING #15 - NEW MECHANICAL PLANS
ELECTRICAL	
E000-15	BUILDING #15 - ELECTRICAL ABBREVIATIONS
E101-15	BUILDING #15 - DEMOLITION & NEW ELECTRICAL PLANS
E501-15	BUILDING #15 - ELECTRICAL DETAILS
PLUMBING	
P000-15	BUILDING #15 - PLUMBING ABBREVIATIONS
P101-15	BUILDING #15 - NEW PLUMBING PLANS
EQUIPMENT	
Q101-15	BUILDING #15 - DEMOLITION & NEW ELEVATOR EQUIPMENT PLANS

BUILDING #17 - SHEET LIST

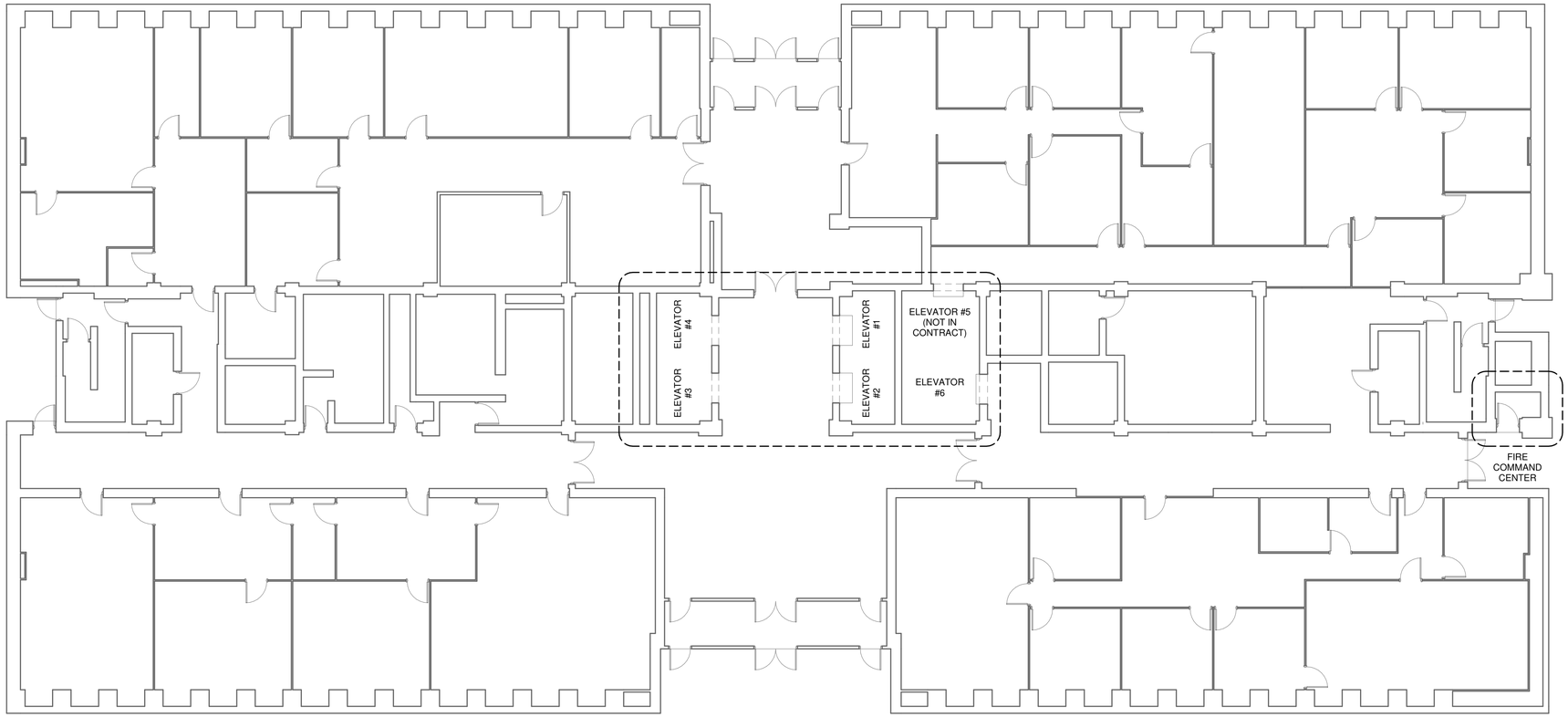
NO.	SHEET NAME
GENERAL	
G000-17	BUILDING #17 - GENERAL BUILDING LAYOUT
MECHANICAL	
M000-17	BUILDING #17 - MECHANICAL ABBREVIATIONS
M101-17	BUILDING #17 - DEMOLITION & NEW MECHANICAL PLANS
ELECTRICAL	
E000-17	BUILDING #17 - ELECTRICAL ABBREVIATIONS
E101-17	BUILDING #17 - DEMOLITION & NEW ELECTRICAL PLANS
E501-17	BUILDING #17 - ELECTRICAL DETAILS & SCHEDULES
PLUMBING	
P000-17	BUILDING #17 - PLUMBING ABBREVIATIONS
P101-17	BUILDING #17 - DEMOLITION & NEW PLUMBING PLANS
FIRE PROTECTION	
F101-17	BUILDING #17 - NEW FIRE PROECTION PLANS
EQUIPMENT	
Q101-17	BUILDING #17 - DEMOLITION & NEW ELEVATOR EQUIPMENT PLANS

BUILDING #84 - SHEET LIST

NO.	SHEET NAME
GENERAL	
G000-84	BUILDING #84 - GENERAL BUILDING LAYOUT
MECHANICAL	
M000-84	BUILDING #84 - MECHANICAL ABBREVIATIONS
M101-84	BUILDING #84 - DEMOLITION & NEW MECHANICAL PLANS
ELECTRICAL	
E000-84	BUILDING #84 - ELECTRICAL ABBREVIATIONS
E101-84	BUILDING #84 - DEMOLITION & NEW ELECTRICAL PLANS
E501-84	BUILDING #84 - ELECTRICAL DETAILS & SCHEDULES
PLUMBING	
P000-84	BUILDING #84 - PLUMBING ABBREVIATIONS
P101-84	BUILDING #84 - DEMOLITION & NEW PLUMBING PLANS
FIRE PROTECTION	
F101-84	BUILDING #84 - NEW FIRE PROTECTION PLANS
EQUIPMENT	
Q101-84	BUILDING #84 - DEMOLITION & NEW ELEVATOR EQUIPMENT PLANS

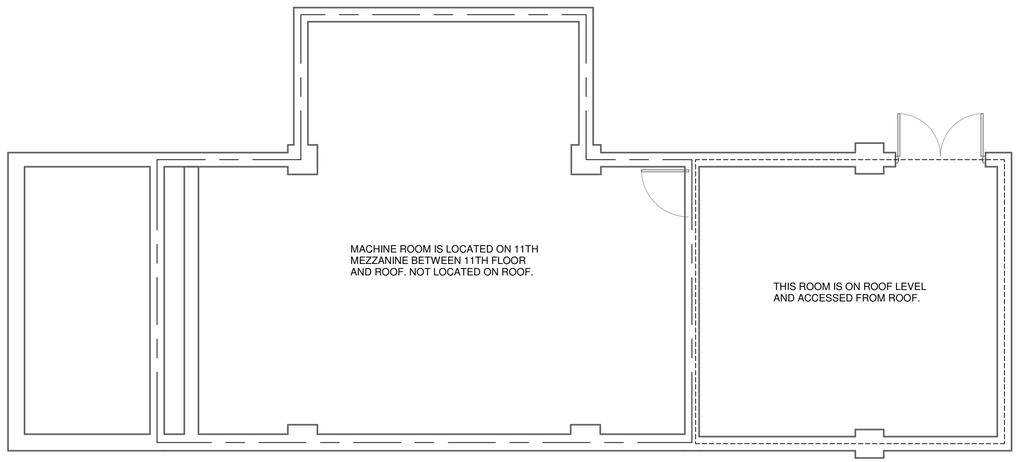
BUILDING #86 - SHEET LIST

NO.	SHEET NAME
GENERAL	
G000-86	BUILDING #86 - GENERAL BUILDING LAYOUT
G001-86	BUILDING #86 - GENERAL TRADES DEMOLITION
G101-86	BUILDING #86 - GENERAL TRADES
G601-86	BUILDING #86 - GENERAL TRADES PARTITION SCHEDULE
MECHANICAL	
M000-86	BUILDING #86 - MECHANICAL ABBREVIATIONS
M101-86	BUILDING #86 - NEW MECHANICAL PLANS
ELECTRICAL	
E000-86	BUILDING #86 - ELECTRICAL ABBREVIATIONS
E001-86	BUILDING #86 - ELECTRICAL DEMOLITION PLANS
E101-86	BUILDING #86 - NEW ELECTRICAL PLANS
E501-86	BUILDING #86 - ELECTRICAL DETAILS
E601-86	BUILDING #86 - ELECTRICAL SCHEDULES
PLUMBING	
P000-86	BUILDING #86 - PLUMBING ABBREVIATIONS
P101-86	BUILDING #86 - DEMOLITION & NEW PLUMBING PLANS
FIRE PROTECTION	
F101-86	BUILDING #86 - FIRE PROTECTION PLANS
EQUIPMENT	
Q001-86	BUILDING #86 - ELEVATOR EQUIPMENT DEMOLITION PLANS
Q101-86	BUILDING #86 - NEW ELEVATOR EQUIPMENT PLANS



1 REFERENCE MASTER FLOOR PLAN - FIRST FLOOR

1" = 10'-0"



2 REFERENCE MASTER PLAN - ROOF/MEZZANINE

3/16" = 1'-0"

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture

Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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DRAWN BY:	JMM
CHECKED BY:	BCM

SHEET NAME:

BUILDING #5 - GENERAL BUILDING LAYOUT

G000-05

MECHANICAL ABBREVIATIONS

SYMBOLS	
#	NUMBER
&	AND
°	DEGREES
°F	DEGREES FAHRENHEIT
A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
AUX	AUXILIARY
AVG	AVERAGE
B	
BFV	BUTTERFLY VALVE
BH	BASEBOARD HEATER
BHP	BRAKE HORESPOWER
BLR	BOILER
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CHKV	CHECK VALVE
CIRC	CIRCULATING
CI	CAST IRON
CKT	CIRCUIT
CMU	CONCRETE MASONARY UNIT
C/O	CLEAN OUT
CON	CONDENSATE
CONT	CONTINUATION
CT	COOLING TOWER
CU	CONDENSING UNIT
D	
DIA	DIAMETER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE(°F)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE(°F)
F	
°F	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	
GAS	NATURAL GAS
GALV	GALVANIZED
GA	GAUGE
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	
HCWL	HYDRONIC CHILLED WATER LOOP
HCWR	HYDRONIC CHILLED WATER RETURN
HCWS	HYDRONIC CHILLED WATER SUPPLY
HHWL	HYDRONIC HOT WATER LOOP
HHWR	HYDRONIC HOT WATER RETURN
HHWS	HYDRONIC HOT WATER SUPPLY
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
J	
JB	JUNCTION BOX
K	
KW	KILOWATT
KWH	KILOWATT HOUR
L	
LAT	LEAVING AIR TEMPERATURE(°F)
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LIQUID PROPANE
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE(°F)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MS	MINI-SPLIT SYSTEM
N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
Q	
QTY	QUANTITY
R	
RA	RETURN AIR
RAD	RADIATOR
RCP	RADIANT CEILING PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SMOKE DAMPER
SENS	SENSIBLE
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T	
T	THERMOSTATE
TA	TRANSFER AIR
TCV	TEMPERATURE CONTROL VALVE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TSTAT	THERMOSTAT
TV	TURNING VANES
TYP	TYPICAL
U	
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	
VOLTS	VOLTAGE
VA	VOLT AMPERES
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VOLTS	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VVT	VARIABLE VOLUME AND TEMPERATURE
W	
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WT	WEIGHT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

MECHANICAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL, COMPLETE, AND OPERATE AS INDICATED ON THE DRAWINGS, SPECIFICATIONS, AND REQUIRED BY CODE.
2. SEPARATE BALANCE DAMPERS WILL BE INSTALLED AT ALL TAKE-OFFS FROM MAIN DUCTS. FIRE DAMPERS WILL BE INSTALLED AT LOCATIONS SHOWN OR WHERE ANY DUCT PENETRATES A FIRE RATED WALL. REFER TO ARCHITECTURAL SHEETS FOR RATED WALLS. FIRE DAMPERS ARE TO MATCH THE RATING OF THE WALL OR CEILING BEING PENETRATED.
3. ALL DUCT TAKE-OFFS AND TRANSITIONS WILL BE TAPERED. ELBOWS AND TURNS SHALL BE CONSTRUCTED w/ A SMOOTH RADIUSED FITTING MIN 1.5 TIMES THE WIDTH OF THE DUCT. TURNING VANES ARE NOT PERMITTED, UNLESS APPROVED BY ENGINEER OR INDICATED ON DRAWINGS.
4. CERTAIN ITEMS SUCH AS RISERS AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC. ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THOSE ITEMS.
5. ALL DUCTWORK IS TO BE EXTERNALLY INSULATED. INTERIOR MOUNTED DUCTWORK SHALL HAVE FOIL FACED 1-1/2 TO 2" FIBERGLASS INSULATION AND SEALED w/ FIBERGLASS REINFORCED FOIL TAPE.
6. CONSTRUCT ALL DUCTWORK PER SMACNA STANDARDS FOR LOW PRESSURE DUCTWORK (2.0" STATIC). ALL JOINTS ARE TO BE SEALED w/ MASTIC.
7. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
8. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING WHERE APPLICABLE.
9. ALL DUCTWORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
10. SEE SPEC FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.
11. PERFORM WORK IN ACCORDANCE w/ CURRENT INTERNATIONAL MECHANICAL CODE, FUEL GAS CODE, ASHRAE, SMACNA, STATE, AND LOCAL CODES AND REQUIREMENTS.
12. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

DUCTWORK SYSTEM LEGEND

ABBREVIATION	SYSTEM NAME
SA	SUPPLY AIR
SA (E)	EXISTING SUPPLY AIR

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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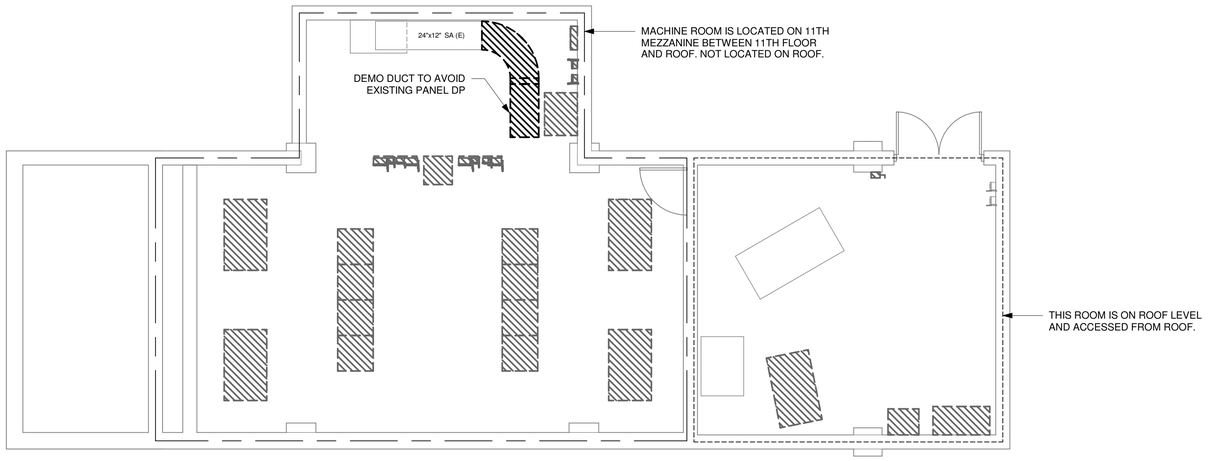
SHEET NAME:

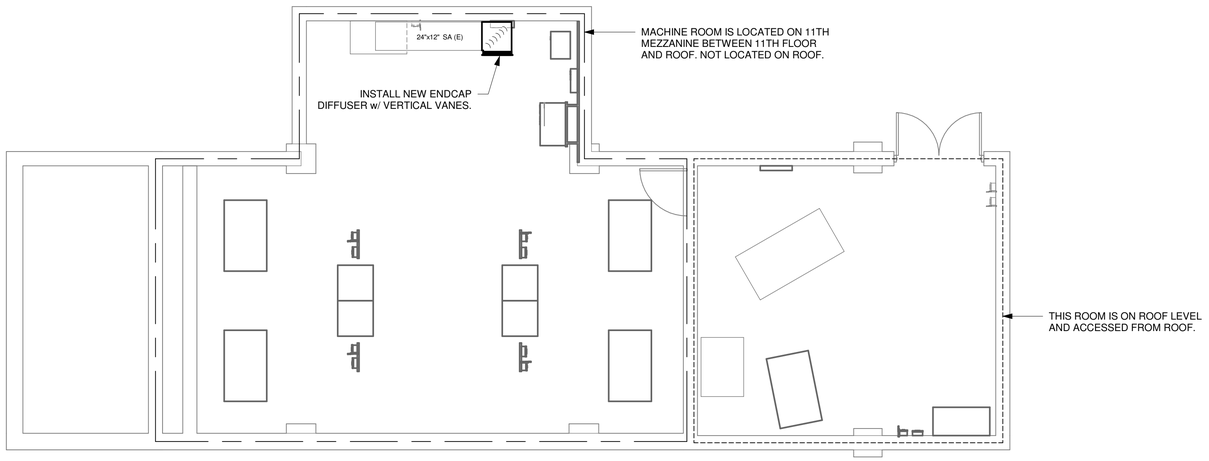
BUILDING #5 - MECHANICAL ABBREVIATIONS

M000-05



1 ROOF/MEZZANINE MECHANICAL DEMO PLAN

3/16" = 1'-0"



2 ROOF/MEZZANINE MECHANICAL PLAN

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MECHANICAL NOTES

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KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
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BUILDING #5 - MECHANICAL PLANS

M101-05

ELECTRICAL ABBREVIATIONS

1P	SINGLE POLE
1PH	SINGLE-PHASE
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3WAY	THREE-WAY
4/C	FOUR-WIRE
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4WAY	FOUR-WAY
4W	FOUR-WIRE
ø	PHASE
A	
A	AMPERE
AC	ALTERNATING CURRENT; ARMORED CABLE
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
A/E	ARCHITECT/ENGINEER
AFC	ABOVE FINISHED COUNTER
AFCI	ARC FAULT CIRCUIT INTERUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANN	ANNUNCIATOR
APPD	APPROVED
APPROX	APPROXIMATELY; APPROXIMATE
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING; AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
ATTN	ATTENTION
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AVG	AVERAGE
AWG	AMERICAN WRE GAUGE
B	
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BFF	BELOW FINISHED FLOOR
BG	BELOW GRADE
BKBD	BACKBOARD
BLDG	BUILDING
BLT	BUILT
BLW	BELOW
BOT	BOTTOM
BPS	BOLTED PRESSURE SWITCH
BRKR	BREAKER
BSMT	BASEMENT
BTWN	BETWEEN
BX	INTERLOCKED ARMORED CABLE
BYP	BYPASS
C	
C	CELSIUS
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION SYSTEM
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CD	CANDELA; CONSTRUCTION DOCUMENTS;
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CIR	CIRCLE
CKT	CIRCUIT
C	CENTERLINE
CL	CURRENT LIMITING; CENTER LINE; CLASS; CLOSE
CLG	CEILING
CLR	CLEAR
CND	CONDUIT
COAX	COAXIAL
COL	COLUMN
COMB	COMBINATION; COMBINED
COMM	COMMUNICATION
COMPR	COMPRESSOR
CONC	CONCRETE
CONN	CONNECT
CORR	CORRELOR; CORRECT
CP	CONTROL PANEL
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTR	CENTER
CTRL	CONTROL
CU	COPPER; COEFFICIENT OF UTILIZATION; CUBIC
CU FT	CUBIC FEET
CUR	CURRENT
D	
D	DEPTH
DB	DIRECT BURIAL / DECIBEL
DBL	DOUBLE
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DEL	DELETE; DELIVER
DEMO	DEMOLITION; DEMONSTRATION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM; DIAGONAL
DIFF	DIFFERENCE
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE; DISTRICT
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION; DIVIDE
DN	DOWN
DOC	DOCUMENT
DPDT	DOUBLE POLE; DOUBLE THROW
DPST	DOUBLE POLE; SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING
E	
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ELR	END OF LINE RESISTOR
EM	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENGR	ENGINEER
ENGY	ENERGY
ENT	ELECTRICAL NONMETALLIC TUBING
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EST	ESTIMATE
ESTB	ESTABLISH
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION; EXPOSED; EXPAND
EXT	EXTERIOR; EXTERNAL
EXTN	EXTENSION
F	
F	FAHRENHEIT; FEMALE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FOOT-CANDLE
FCU	FAN COIL UNIT
FDR	FEEDER
FIN	FINISH
FIN GR	FINISH GRADE
FIXT	FIXTURE
FL MT	FLUSH MOUNT
FLEX	FLEXIBLE
FLG	FLOORING
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FREQUENCY MODULATION
FP	FIREPROOF
FR	FIRE RESISTANT
FREQ	FREQUENCY
FS	FUSIBLE SWITCH; FLOW SWITCH
FSC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET; FIRE TREATED; FOOT
FU	FUSE
FU SW	FUSED SWITCH
FURN	FURNISH; FURNACE; FURNITURE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL; GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GOVT	GOVERNMENT
GRN	GROUND
GYP	GYPSUM
H	
HDW	HARDWARE
HF	HIGH FREQUENCY
HID	HIGH INTENSITY DISCHARGE
HO	HOLD OPEN
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER; HEAT PUMP; HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ; FREQUENCY IN CYCLES PER SECOND
I	
ID	INSIDE DIAMTER; INSIDE DIMENSION; IDENTIFICATION
ILLUM	ILLUMINATION
IMC	INTERMEDIATE METAL CONDUIT
INFO	INFORMATION
INSUL	INSULATION
INTERCOM	INTERCOMMUNICATION
INTL	INTERNATIONAL
IR	INFRARED; INSIDE RADIUS
IT	INFORMATION TECHNOLOGY
J	
JB	JUNCTION BOX
K	
KCMIL	THOUSAND CIRCULAR MILS
KHz	KILOHERTZ
KIT	KITCHEN
KO	KNOCKOUT
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kVAh	KILOVOLT AMPERE PER HOUR
kVAR	KILOVAR; KILOVOLT AMPERE REACTIVE
kW	KILOWAT
kWh	KILOWATT HOURS
L	
L	LITER; ANGLE
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LM	LUMEN
LOC	LOCATION
LP	LIGHT POLE; LOW PRESSURE
LPW	LUMENS PER WATT
LT	LIGHT
LT SW	LIGHT SWITCH
LTD	LIMITED
LTG	LIGHTING
LV	LOW VOLTAGE
M	
M	METER
mA	MILLIAMPERE
MACH	MACHINE
MAG	MAGNET
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMIM
MC	MECHANICAL CONTRACTOR; METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MED	MEDICAL; MEDIUM
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MH	MANHOLE; METAL HALIDE
MHZ	MEGAHERTZ
MI	MINERAL INSULATED
MIC	MICROPHONE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOA	MULTIOUTLET ASSEMBLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MODIFY; MODULE
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MEETING; MOUNTING
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MULT	MULTIPLE
mV	MILLIVOLT
MVA	MEGAVOLT-AMPERE
MW	MEGAWATT; MICROWAVE
mW	MILLIWATT
MWH	MEGAWATT HOUR
N	
N	NORTH
NC	NORMALLY CLOSED
NE	NORMAL EMERGENCY
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN; NUMBER
NORM	NORMAL
NTS	NOT TO SCALE
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OH	OVERHEAD
OL	OVERLOAD ELEMENT
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OVC	OVERCURRENT
P	
P	POLE (S); PILOT
PA	POWER AMPLIFIER; PUBLIC ADDRESS
PART	PARTIAL
PB	PULL BOX; PANEL BOARD; PANIC BAR; PUSH-BUTTON
PC	PLUMBING CONTRACTOR; PIECE
PE	PHOTOELECTRIC, PNEUMATIC ELECTRIC
PEN	PENETRATE
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PLBG	PLUMBING
PNL	PANEL
POS	POSITION; POSITIVE
PP	POWER POLE
PR	PAIR
PRELIM	PRELIMINARY
PREP	PREPARATION
PRESS SW	PRESSURE SWITCH
PREV	PREVIOUS
PRI	PRIMARY
PROJ	PROJECT
PS	PULL STATION
PT	POTENTIAL TRANSFORMER
PVC	POLYVINAL CHLORIDE (PLASTIC)
PWR	POWER
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QTY	QUANTITY
QUAL	QUALITY
R	
R	RELAY; RADIUS
R/W	RIGHT OF WAY
RC	REMOTE CONTROL
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RCPT	RECEPTACLE
REF	REFRIGERATOR; REFERENCE
REINF	REINFORCED
REPL	REPLACE
REQD	REQUIRED
REV	REVISION; REVOLUTIONS
RFI	REQUEST FOR INFORMATION
RFP	REQUEST FOR PROPOSAL
RH	RIGHT HAND
RHC	REHEAT COIL
ROW	RIGHT OF WAY
RS	RAPID START
RTG	RATING
RTU	ROOF TOP UNIT
S	
S/S	START / STOP
SAMP	SAMPLE
SCHED	SCHEDULE
SCHEM	SCHEMATIC
SD	SMOKE DETECTOR
SDMPR	SMOKE DAMPER
SEC	SECONDARY
SECT	SECTION
SEP	SEPARATE
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SMR	SURFACE MOUNTED RACEWAY
SNSR	SENSOR
SOLV	SOLENOID VALVE
SPDT	SINGLE POLE; DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPLY	SUPPLY
SPST	SINGLE POLE; SINGLE THROW
SQ	SQUARE
SS	STAINLESS STEEL
ST	SINGLE THROW; STAIRS; STREET
ST PR	STATIC PRESSURE
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STARTER; STRAIGHT; STRIKE; STRINGERS
STRB	STROBE
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLEMENTARY
SUPVR	SUPERVISOR
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH; SIDEWALK
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL
SYS	SYSTEM
T	
T&M	TIME AND MATERIAL
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRU	THROUGH
TL	TWIST LOCK
TOC	TOP OF CONCRETE; TOP OF CURB
TOL	TOLERANCE
TP	TWISTED PAIR; TELEPHONE POLE
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TV	TELEVISION
TVOUT	TELEVISION OUTLET
TYP	TYPICAL
U	
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UL	UNDER WRITERS LABORATORIES
UTP	UNSHIELDED TWITED PAIR
UTIL	UTILITY
UV	UNIT VENTILATOR; ULTRAVIOLET
V	
V	VOLT
VA	VOLT AMPERE
VAM	VOLTAMMETER
VAR	VARIATION; VARIES; VOLT AMPERE REACTIVE
VD	VOLTAGE DROP; VOLUME DAMPER
VERT	VERTICAL
VF	VARIABLE FREQUENCY
VFD	VARIABLE FREQUENCY DRIVE
VID	VIDEO
VIF	VERIFY IN FIELD
VOLT	VOLTAGE
VR	VOLTAGE REGULATOR; VAPOR RETARDED
VRFY	VERIFY
VRLY	VOLTAGE RELAY
VS	VOLTMETER SWITCH; VENT STACK
W	
W	WIRE; WATT; WASTE; WEST; WIDE
W/	WITH
W/O	WITHOUT
WHM	WATTHOUR METER
WP	WEATHERPROOF; WATER PUMP; WATER HEATER
WR	WEATHER RESISTANT; WATER REPELLENT
WW	WIREWAY; WARM WHITE; WASTE WATER
X	
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

ELECTRICAL LEGEND

	120V DUPLEX RECEPTACLE
GFCI	120V GFCI DUPLEX RECEPTACLE
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH

LIGHTING LEGEND

$	SINGLE POLE SWITCH
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH
$D	DIMMING SWITCH
$3D	THREE WAY DIMMING SWITCH
$OC	SINGLE POLE SWITCH w/ OCCUPANCY SENSOR

COMMUNICATION LEGEND

TV	TELE/DATA LOCATION. PROVIDE SINGLE GANG BOX w/ 1" CONDUIT TO ABOVE ACCESSIBLE CEILING.
▼	TELEPHONE LOCATION
▽	DATA LOCATION
TV	TELEVISION LOCATION. PROVIDE SINGLE GANG BOX w/ 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING.

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY, ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. TV AND TELEPHONE CABLING SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
10. GROUP AND TRAIN ALL TEL/DATA AND CABLE TV CABLE. SUPPORT FROM STRUCTURE.
11. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
12. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
13. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

COMMUNICATION NOTES

1. TELE/DATA AND CATV CONDUIT IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY ARCHITECT.
2. CONDUIT AND PULL STRING WILL BE REQUIRED AT ALL TELE/DATA AND CATV LOCATIONS ON THE DRAWINGS.
3. PROVIDE TELE/DATA AND CATV AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS w/ OWNER PRIOR TO INSTALLATION.
4. RACEWAY SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
5. TELE/DATA AND CATV WIRING TO BE PERFORMED BY OWNER'S CONTRACTOR. CONTRACTOR IS TO PROVIDE RACEWAY AND PULL STRING AT EACH LOCATION INDICATED.
6. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.
7. PERFORM ALL WORK IN ACCORDANCE 2017 NEC.
8. COORDINATION OF FINAL FIXTURE LOCATION w/ OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

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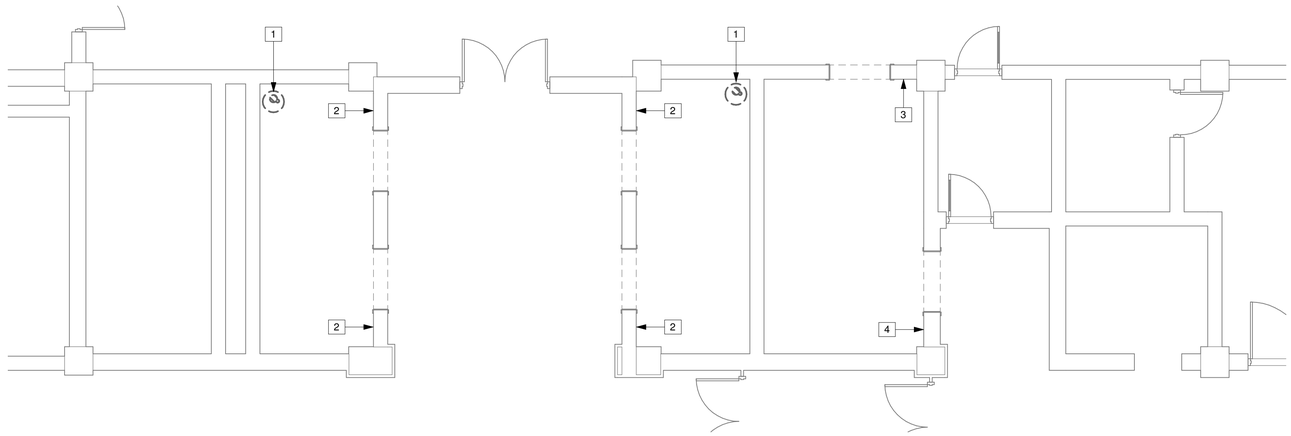
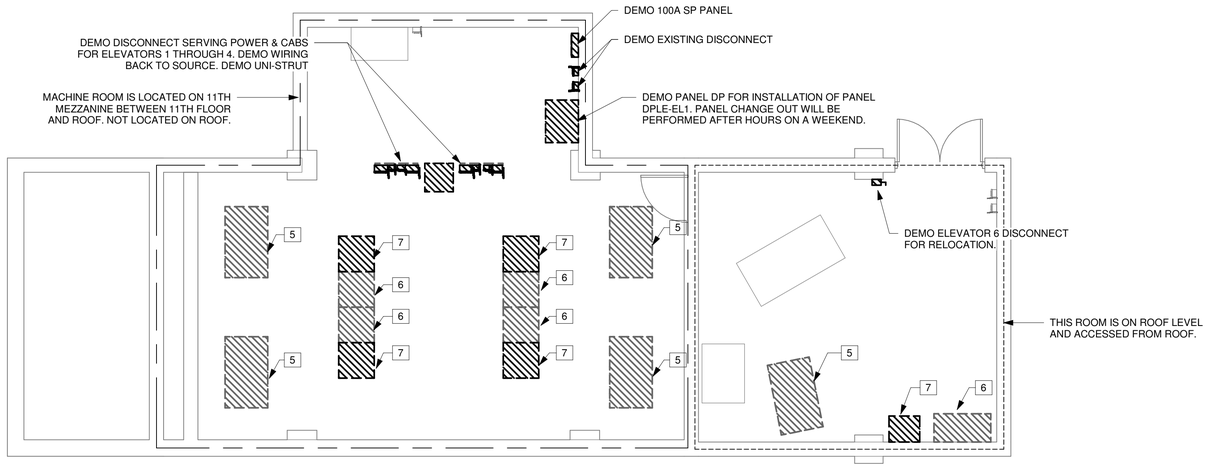
BUILDING #5 - ELECTRICAL ABBREVIATIONS

E000-05



1 BASEMENT ELECTRICAL DEMOLITION PLAN

3/16" = 1'-0"



2 ROOF/MEZZANINE ELECTRICAL DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO POWER TO SUMP PUMPS FOR RECONNECTION.
2. DEMO SHAFT PIT LIGHTS AND SWITCHES FOR REPLACEMENT. RELOCATE SWITCHES TO MEET ELEVATOR CODE AS NECESSARY.
3. NEW SHAFT LIGHTS AND FREIGHT CAR PIT SWITCH TO REMAIN.
4. DEMO ELEVATOR 5 PIT SWITCH FOR REPLACEMENT.
5. DEMO CONDUIT AND WIRE FEEDING ELEVATOR MOTOR.
6. DEMO CONDUIT AND WIRE FEEDING ELEVATOR CONTROLLER.
7. DEMO TRANSFORMER.
8. COORDINATE WORK WITH ELEVATOR REPLACEMENT.

KEY PLAN
N.T.S.

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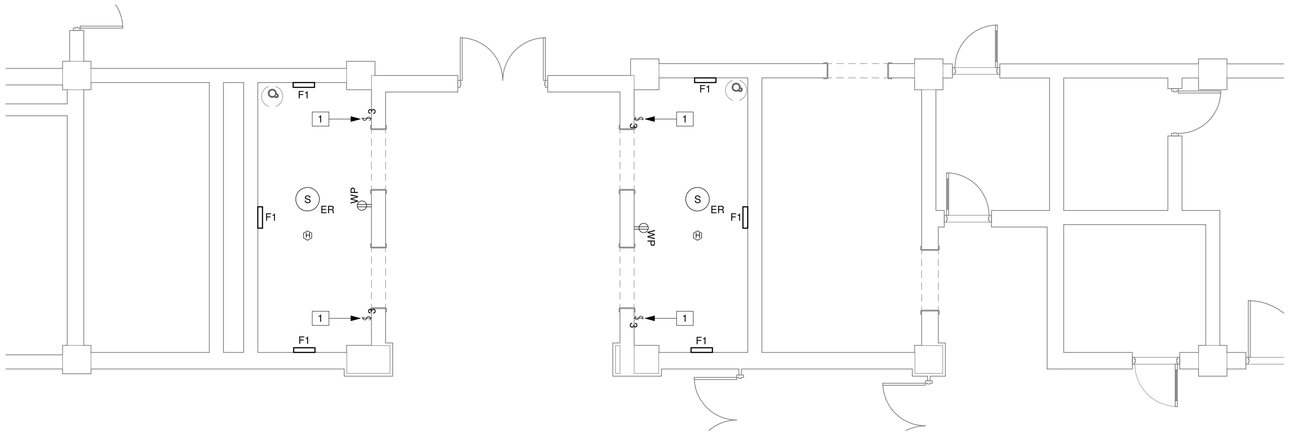
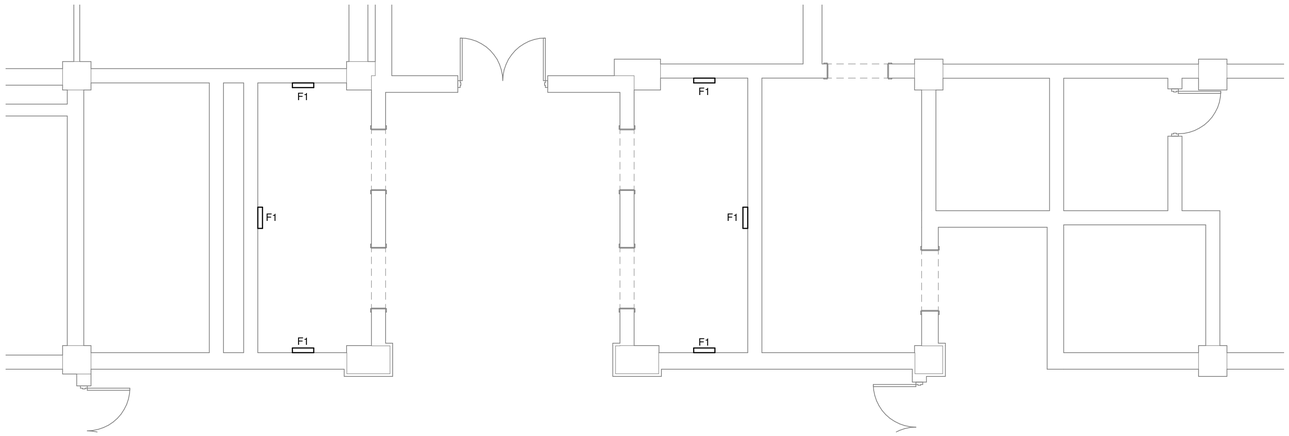
BUILDING #5 - ELECTRICAL DEMOLITION PLANS

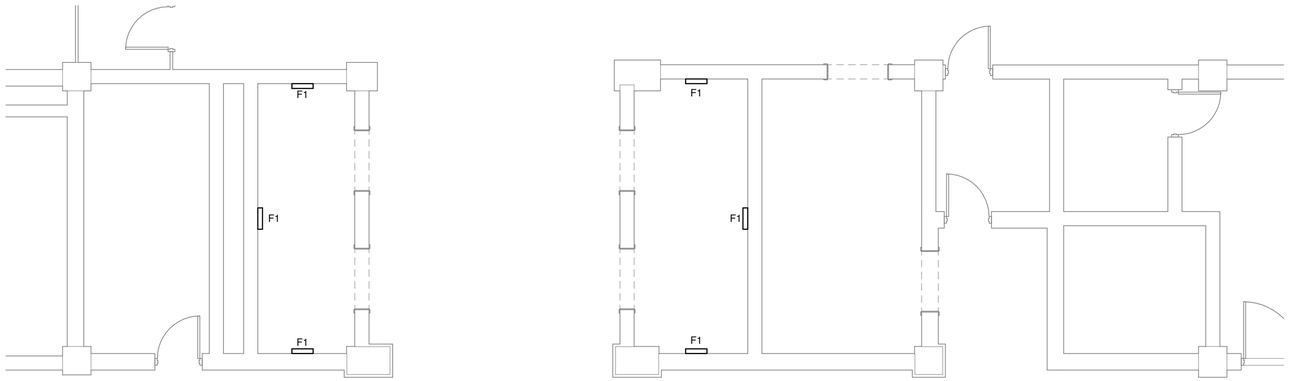
E001-05



1 BASEMENT ELECTRICAL PLAN
3/16" = 1'-0"



2 FIRST FLOOR ELECTRICAL PLAN
3/16" = 1'-0"



3 SECOND FLOOR ELECTRICAL PLAN
3/16" = 1'-0"

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
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4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
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ELECTRICAL LEGEND

	120V DUPLEX RECEPTACLE
GFCI	120V GFCI DUPLEX RECEPTACLE
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH

SHEET NOTES

1. PROVIDE DPDT RIB RELAY IN MACHINE ROOM TO ACT AS A 4-WAY SWITCH WITH THE (2) 3-WAY SWITCHES IN THE SHAFT PITS AND THE 4-WAY SWITCH IN THE SHAFT MEZZANINE. TIE THE RIB RELAY TO A FIRE ALARM OUTPUT MODULE TO ACTIVATE THE SHAFT LIGHTS ON A FIRE ALARM.
2. PLACE IN ELEVATOR PIT AREA.

KEY PLAN
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WV OFFICE:
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MORGANTOWN, WV 26508
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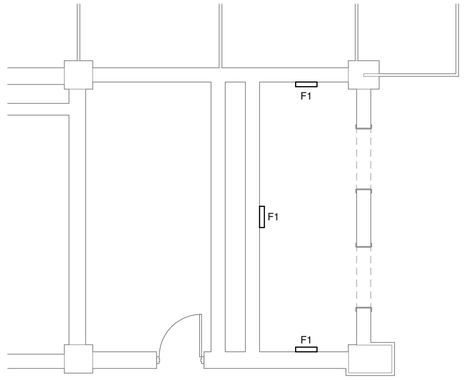
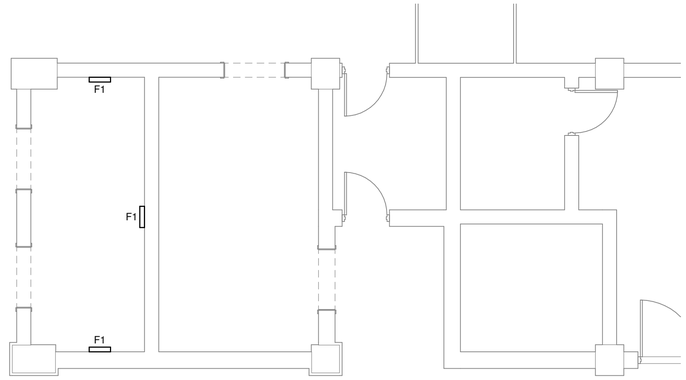
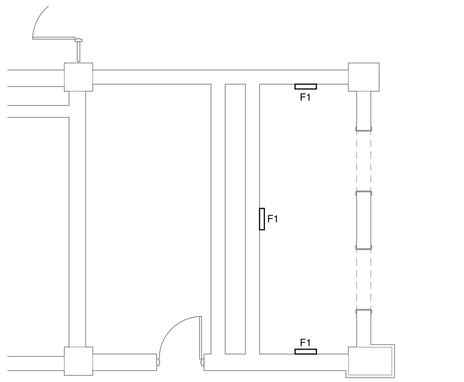
BUILDING #5 - NEW ELECTRICAL PLANS

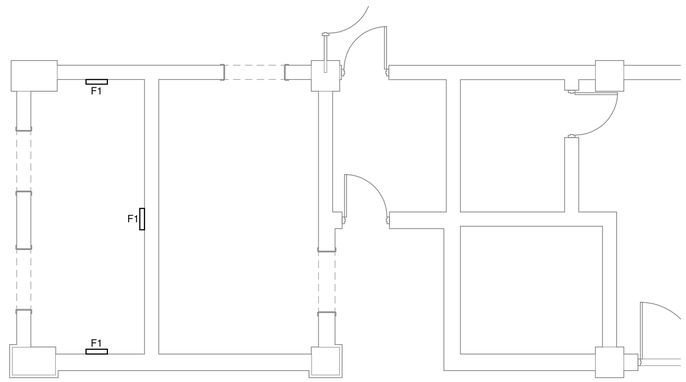
E101-05



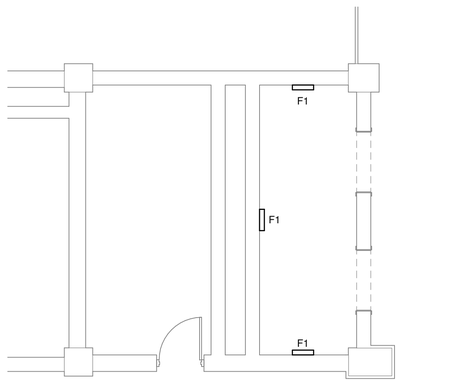


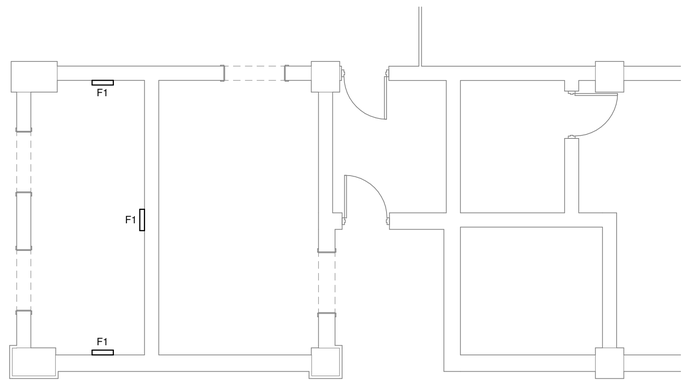
1 THIRD FLOOR ELECTRICAL PLAN
3/16" = 1'-0"





2 FOURTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"





3 FIFTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
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FIRE ALARM LEGEND

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H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
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ELECTRICAL LEGEND

	120V DUPLEX RECEPTACLE
GFCI	120V GFCI DUPLEX RECEPTACLE
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
$3	THREE WAY SWITCH
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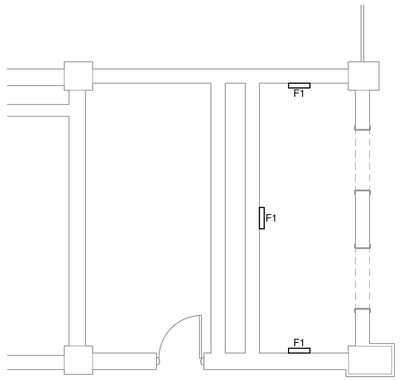
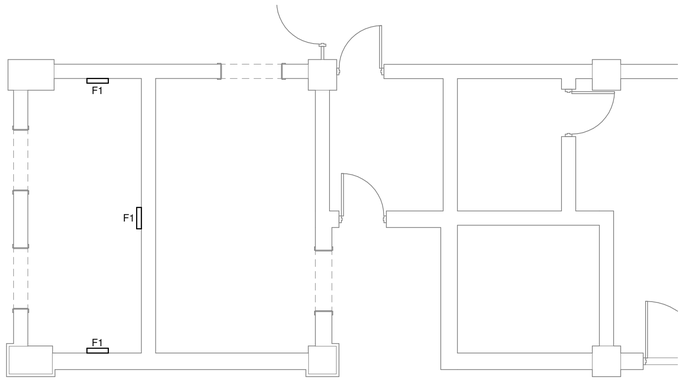
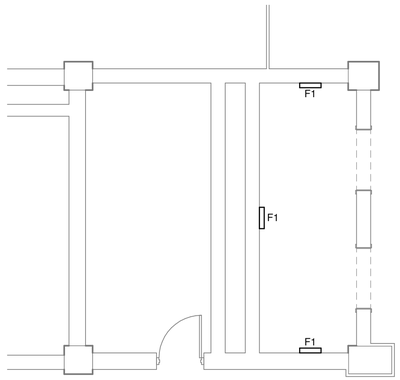
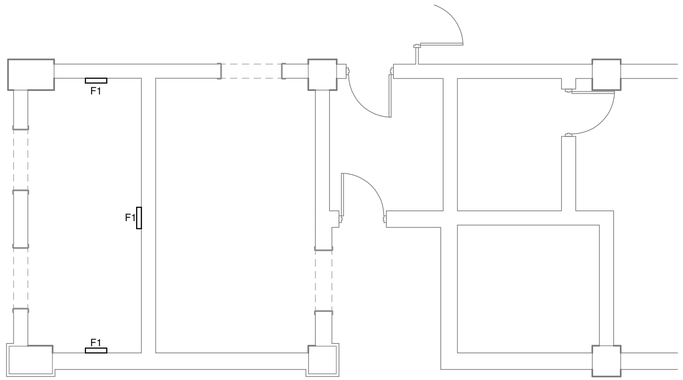


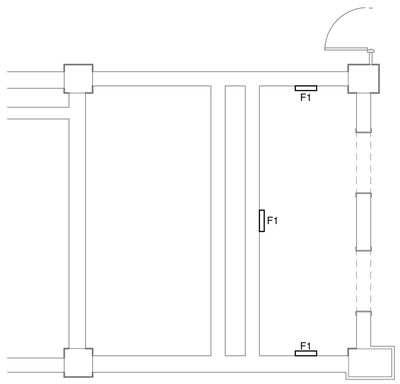


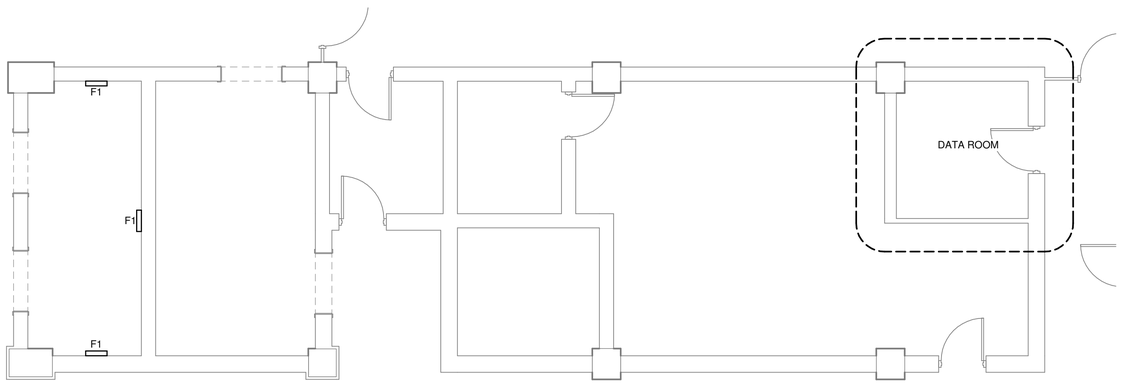
1 SIXTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"





2 SEVENTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"





3 EIGHTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. TV AND TELEPHONE CABLING SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
10. GROUP AND TRAIN ALL TEL/DATA AND CABLE TV CABLE. SUPPORT FROM STRUCTURE.
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ELECTRICAL LEGEND

	120V DUPLEX RECEPTACLE
GFCI	120V GFCI DUPLEX RECEPTACLE
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH

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Keyser, WV 26726
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www.montumarch.com

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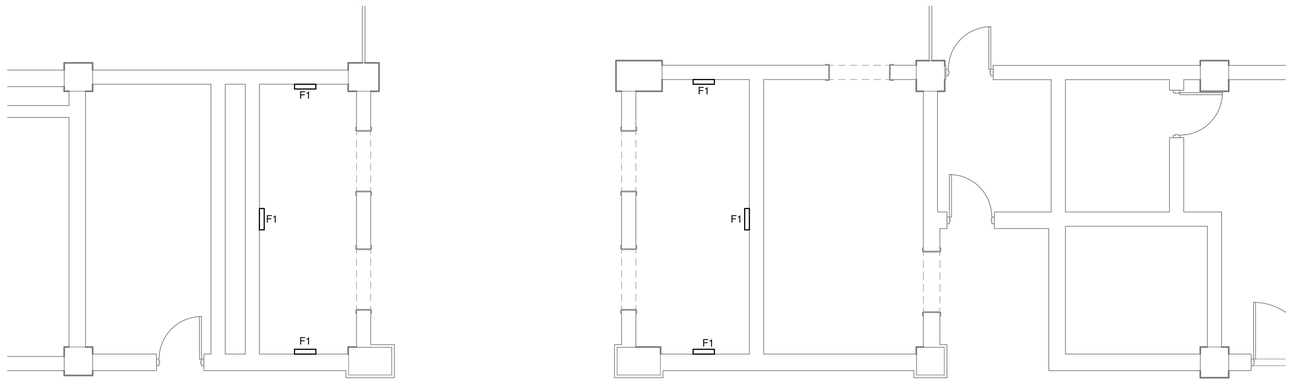
BUILDING #5 - NEW ELECTRICAL PLANS

E103-05



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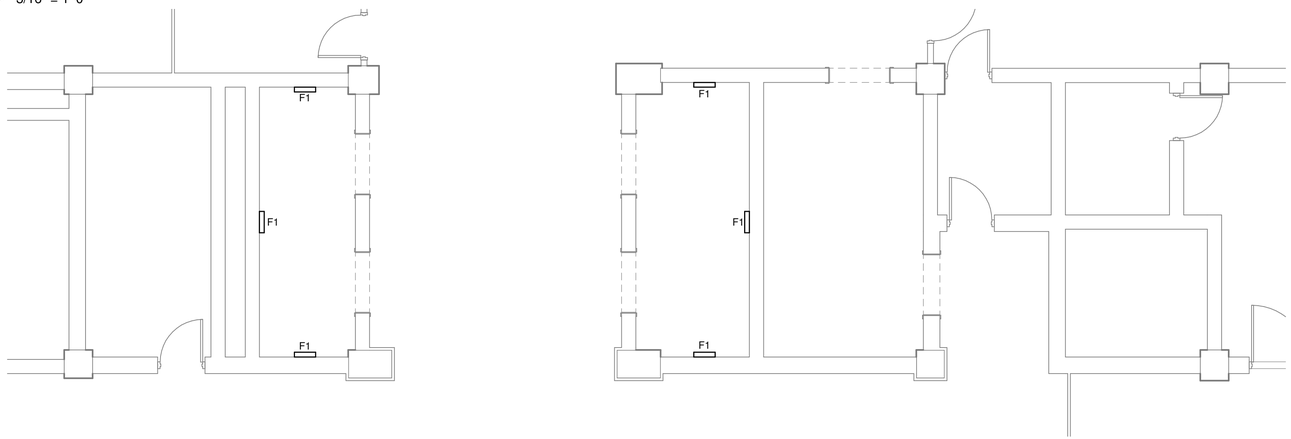

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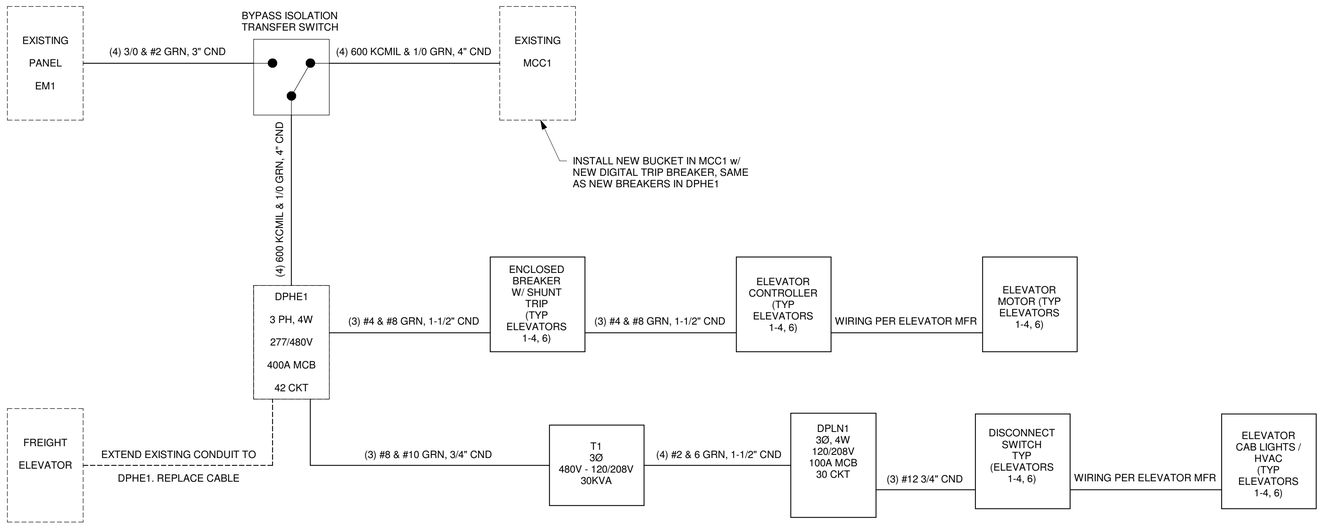

3 ELEVATORS 1-6 MACHINE ROOM POWER ONE-LINE
DRAWING NOT SCALABLE

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GFCI	120V GFCI DUPLEX RECEPTACLE
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$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH

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LIGHT FIXTURE SCHEDULE

TAG	MFR	MODEL	LUMENS	COLOR TEMP.	VOLTS	WATTS	COMMENTS
F1	LUMINAIRE LED	ESF18-NODIM-50W-40K-MVOLT-CLP-GRY-EMB310-WL-NOOCC	5,280 lm	4,000 K	120-277	50 W	WALL MT VANDAL RESISTANT LED FIXTURE. CLEAR, PRISMATIC LENS. GRAY HOUSING. WET LOCATION. EMERGENCY BACKUP (1,200 LUMENS).

ENCLOSED BREAKER SCHEDULE

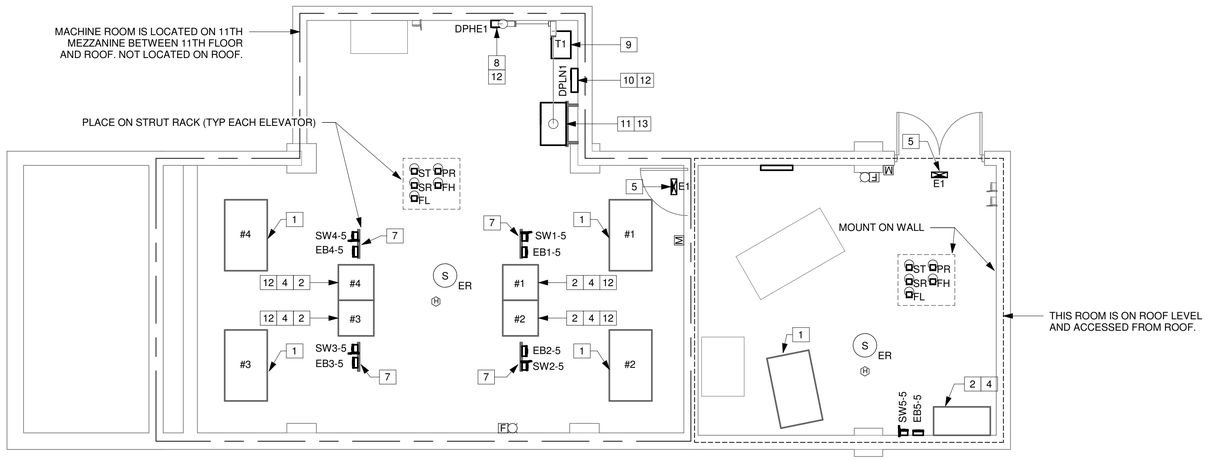
TAG	SERVES	POLES	VOLTS	TRIP	ENCLOSURE	DESCRIPTION
EB1-5	ELEVATOR 1 POWER	3	480 V	100 A	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY; COORDINATE w/ THE ELEVATOR CONTRACTOR PRIOR TO BIDDING
EB2-5	ELEVATOR 2 POWER	3	480 V	100 A	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY; COORDINATE w/ THE ELEVATOR CONTRACTOR PRIOR TO BIDDING
EB3-5	ELEVATOR 3 POWER	3	480 V	100 A	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY; COORDINATE w/ THE ELEVATOR CONTRACTOR PRIOR TO BIDDING
EB4-5	ELEVATOR 4 POWER	3	480 V	100 A	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY; COORDINATE w/ THE ELEVATOR CONTRACTOR PRIOR TO BIDDING
EB5-5	ELEVATOR 6 POWER	3	480 V	175 A	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY; COORDINATE w/ THE ELEVATOR CONTRACTOR PRIOR TO BIDDING

DISCONNECT SWITCH SCHEDULE

TAG	SERVES	POLES	VOLTS	DEVICE RATING	FUSING	NEMA ENCLOSURE	TYPE
SW1-5	ELEVATOR 1 CAB	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH
SW2-5	ELEVATOR 2 CAB	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH
SW3-5	ELEVATOR 3 CAB	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH
SW4-5	ELEVATOR 4 CAB	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH
SW5-5	ELEVATOR 6 CAB	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH

EXIT & EMERGENCY LIGHTING SCHEDULE

TAG	MFR	MODEL	DESCRIPTION
E1	LITHONIA	LHQMLEDRHOSD	COMBINATION EXIT SIGN & EMERGENCY LIGHT. WHITE THERMOPLASTIC HOUSING W/ RED LETTERING.



ROOF/MEZZANINE ELECTRICAL PLAN

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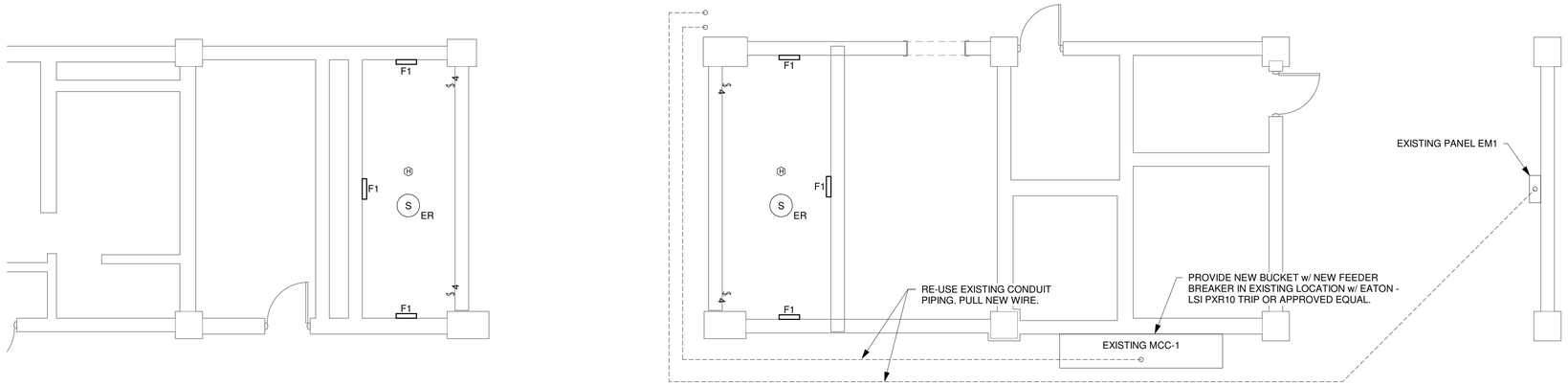

ELEVENTH FLOOR ELECTRICAL PLAN

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FIRE ALARM NOTES

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FIRE ALARM LEGEND

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- H — HEAT DETECTOR
- F — HORN / STROBE
- S — STROBE LIGHT
- ST — ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
- PR — ADDRESSABLE MODULE - PRIMARY RECALL
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- 120V DUPLEX RECEPTACLE
- GFCI — 120V GFCI DUPLEX RECEPTACLE
- WP — 120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
- $3 — THREE WAY SWITCH
- $4 — FOUR WAY SWITCH

SHEET NOTES

1. TERMINATE POWER AT ELEVATOR MOTOR.
2. TERMINATE POWER AT ELEVATOR CONTROLLER.
3. INSTALL NEW 3P/45A BREAKER IN PANEL DP TO FEED NEW TRANSFORMER. PROVIDE FILLER PLATES & BUS MOUNTING HARDWARE AS NEEDED.
4. ROUTE (2) CAT6a FROM MACHINE ROOM TO DATA ROOM LOCATED ON THE EIGHTH FLOOR. SEE SHEET E103-05 FOR LOCATION.
5. TIE TO NEAREST LIGHT CIRCUIT AHEAD OF SWITCH.
6. PROVIDE RIB RELAY IN CONJUNCTION WITH 3-WAY AND 4-WAY LIGHT SWITCHES IN SHAFT TO INTERCONNECT TO FIRE ALARM SYSTEM SUCH THAT FIRE ALARM WILL TURN ON SHAFT LIGHTS WHEN ACTIVATED.
7. INSTALL NEW UNI-STRUT RACK FOR ELECTRICAL EQUIPMENT.
8. NEW 400A, 42 CIRCUIT, 480V, 3 PH, FULLY RATED, COPPER BUS, SURFACE MOUNTED EATON PANEL (CATALOG #P24E400BT42CH01). CIRCUITS TO BE REFED FROM EXISTING ELEVATOR PANEL. 480V VOLT PANEL TO BE IN PLACE PRIOR TO DEMOLITION OF EXISTING ELEVATOR PANEL. ATS TO BE INSTALLED IN EXISTING PANEL DP LOCATION DURING WEEKEND OUTAGE.
9. NEW 3 PH, 30KVA EATON GENERAL PURPOSE VENTED TRANSFORMER. 480 PRIMARY VOLTS; 208Y/120 SECONDARY VOLTS.
10. NEW 100A, 30 CIRCUIT, 208Y/120, 3 PH, FULLY RATED, COPPER BUS, SURFACE MOUNTED EATON PANEL. RE-FEED CIRCUITS FROM EXISTING SP PANEL.
11. ROUTE (1) 1" CONDUIT TO GENERATOR LOCATION. PROVIDE WIRING BETWEEN GENERATOR AND ANNUNCIATOR TO ALLOW CONTROL / REMOTE START
12. RECONNECT ALL LOADS TO MAKE ELEVATORS FULLY OPERATIONAL AT CONCLUSION OF CHANGE OVER OUTAGE. INSTALL PANELS AND ATS PRIOR TO START OF ELEVATOR RENOVATIONS SO PERMANENT WIRING METHODS MAY BE USED DURING RENOVATIONS.
13. NEW CUMMINS 400A, 3 POLE BYPASS ISOLATION TRANSFER SWITCH (PART #: A007B639C). MOUNT ON UNI-STRUCT RACK 12" OFF OF WALL.

KEY PLAN
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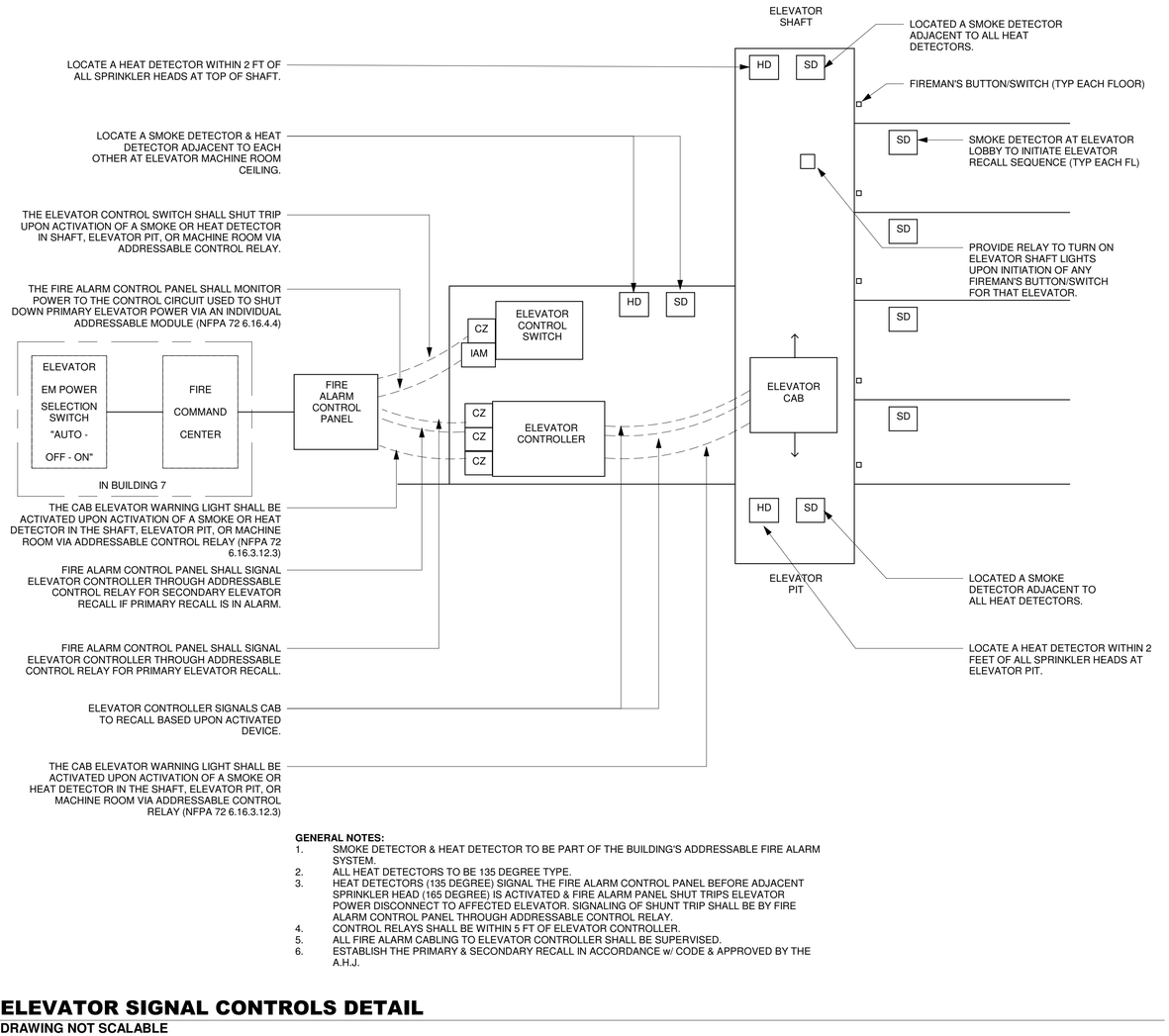
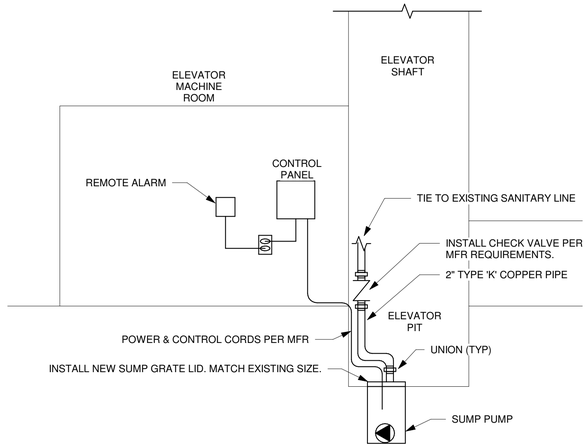


GENERAL NOTES:

1. SMOKE DETECTOR & HEAT DETECTOR TO BE PART OF THE BUILDING'S ADDRESSABLE FIRE ALARM SYSTEM.
2. ALL HEAT DETECTORS TO BE 135 DEGREE TYPE.
3. HEAT DETECTORS (135 DEGREE) SIGNAL THE FIRE ALARM CONTROL PANEL BEFORE ADJACENT SPRINKLER HEAD (165 DEGREE) IS ACTIVATED & FIRE ALARM PANEL SHUT TRIPS ELEVATOR POWER DISCONNECT TO AFFECTED ELEVATOR. SIGNALING OF SHUNT TRIP SHALL BE BY FIRE ALARM CONTROL PANEL THROUGH ADDRESSABLE CONTROL RELAY.
4. CONTROL RELAYS SHALL BE WITHIN 5 FT OF ELEVATOR CONTROLLER.
5. ALL FIRE ALARM CABLING TO ELEVATOR CONTROLLER SHALL BE SUPERVISED.
6. ESTABLISH THE PRIMARY & SECONDARY RECALL IN ACCORDANCE w/ CODE & APPROVED BY THE A.H.J.

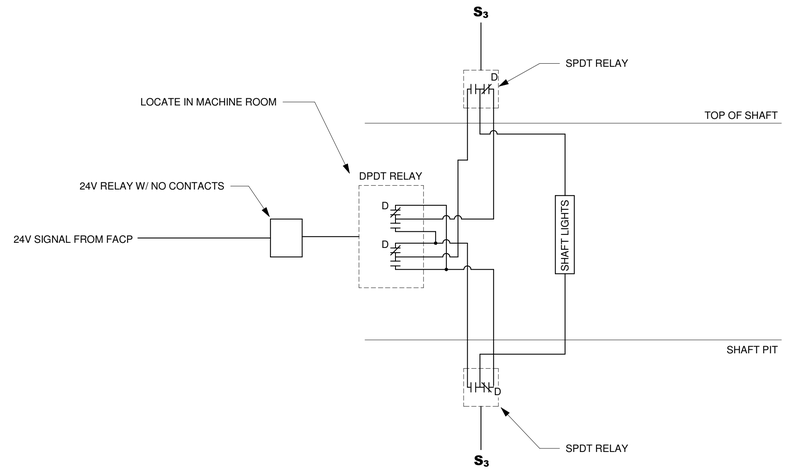
(1) ELEVATOR SIGNAL CONTROLS DETAIL

DRAWING NOT SCALABLE



(2) SUMP PUMP ELECTRICAL DETAIL

DRAWING NOT SCALABLE



(3) SHAFT LIGHTING FIRE ALARM INTERFACE DETAIL

DRAWING NOT SCALABLE

Branch Panel: DPHE1

VOLTS: 480/277 Wye
WIRES: 4
ENCLOSURE: NEMA 1 Indoor
PHASES: 3
MAIN: 400 A
MAIN TYPE: MCB

CKT	Circuit Description	Trip	Poles		Poles	Trip	Circuit Description	CKT
1								2
3	ELEVATOR 1	70 A	3		3	70 A	ELEVATOR 2	4
5								6
7								8
9	ELEVATOR 3	70 A	3		3	70 A	ELEVATOR 4	10
11								12
13								14
15	FREIGHT ELEVATOR	100 A	3		3	70 A	ELEVATOR 6	16
17								18
19								20
21	T1	45 A	3					22
23								24
25								26
27								28
29								30
31								32
33								34
35								36
37								38
39								40
41								42

Notes:
1) Provide all breakers with Eaton LSI PXR10 trip units, or approved equal.
2) Perform a coordination study on the new panel, its feeder breaker in MCC#1 on the 11th floor, and the MCC feeder breaker in the building main distribution to ensure fault isolation at the first point above the fault location to ensure continued elevator operation if possible. Perform all field verification required for the study. Adjust all trip settings to meet the recommendations of the study.

Branch Panel: DPLN1

VOLTS: 120/208 Wye
WIRES: 4
ENCLOSURE: NEMA 1 Indoor
PHASES: 3
MAIN: 100 A
MAIN TYPE: MCB

CKT	Circuit Description	Trip	Poles		Poles	Trip	Circuit Description	CKT
DPLN1-1	ELEVATOR 1 CAB	20 A	1		1	20 A	ELEVATOR 2 CAB	DPLN1-2
DPLN1-3	ELEVATOR 3 CAB	20 A	1		1	20 A	ELEVATOR 4 CAB	DPLN1-4
DPLN1-5	ELEVATOR 6 CAB	20 A	1		1	20 A	SPARE	DPLN1-6
DPLN1-7	SPARE	20 A	1		1	20 A	SPARE	DPLN1-8
DPLN1-9	SPARE	20 A	1		1	20 A	SPARE	DPLN1-10
DPLN1-11	SPARE	20 A	1		1	20 A	SPARE	DPLN1-12
DPLN1-13								DPLN1-14
DPLN1-15								DPLN1-16
DPLN1-17								DPLN1-18
DPLN1-19								DPLN1-20
DPLN1-21								DPLN1-22
DPLN1-23								DPLN1-24
DPLN1-25								DPLN1-26
DPLN1-27								DPLN1-28
DPLN1-29								DPLN1-30

Notes:
1) Provide all breakers with Eaton LSI PXR10 trip units, or approved equal.
2) Perform a coordination study on the new panel, its feeder breaker in MCC#1 on the 11th floor, and the MCC feeder breaker in the building main distribution to ensure fault isolation at the first point above the fault location to ensure continued elevator operation if possible. Perform all field verification required for the study. Adjust all trip settings to meet the recommendations of the study.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
JAMES R. MILLER REGISTERED 15184 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

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BUILDING #5 - ELECTRICAL DETAILS

E501-05

PLUMBING ABBREVIATIONS

A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABLITIES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
B	
BB	BASEBOARD
BC	BALANCING COCK
BD	BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BLR	BOILER
BLW	BELOW
BO	BLOW OFF
BTM	BOTTOM
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CDL	CONDENSATE DRAIN LINE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHKV	CHECK VALVE
CHWR	CHILLED & HOT WATER RETURN
CHWS	CHILLED & HOT WATER SUPPLY
CHWS&R	CHILLED & HOT WATER SUPPLY AND RETURN
CIRC	CIRCULATING
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
CLG	CEILING
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
C/O	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWFT	CONDENSER WATER FROM TOWER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SUPPLY AND RETURN
CWTT	CONDENSER WATER TO TOWER
D	
D	DEEP
Db	DRY BULB TEMPERATURE(ºF)
DCO	DOUBLE CLEAN OUT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM
DISCH	DISCHARGE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPT	DEW POINT TEMPERATURE(ºF)
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
E	
EA	EACH
EC	ELECTRICAL CONTRACTOR
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER(BOTTOMS FLAT)
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATUR(ºF)
F	
ºF	FAHRENHEIT
FA	FREE AREA
FB	FREE BLOW
F&T	FLOAT AND THERMOSTATIC TRAP
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FDN	FOUNDATION
FF	FOULING FACTOR
FIN	FINISHED
FLA	FULL LOAD AMPS
FLG	FLANGE
FLR	FLOOR
FNL	FUNNEL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOS&R	FUEL OIL SUPPLY AND RETURN
FOV	FUEL OIL VENT
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE/FEET
FTG	FITTING
FURN	FURNISH
FV	FACE VELOCITY
FW	FEED WATER
G	
G	GAS
GALV	GALVANIZED
GA	GAUGE, GAGE
GC	GENERAL CONTRACTOR
GCWR	GLYCOL CHILLED WATER RETURN
GCWS	GLYCOL CHILLED WATER SUPPLY
GHWR	GLYCOL HOT WATER RETURN
GHWS	GLYCOL HOT WATER SUPPLY
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAV	GRAVITY
GRV	GRAVITY ROOF VENTILATOR
GV	GATE VALVE
H	
H	HEIGHT
HB	HOSE BIBB
HC	HEATING CONTRACTOR; HANICAPPED
HD	HEAD/HUB DRAIN
HG	MERCURY
HGR	HANGER
HP	HORSEPOWER/HEAT PUMP
HORIZ	HORIZONTAL
HPD	HIGH PRESSURE DRIP
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HTR	HEATER
HUH	HORIZONTAL UNIT HEATER
HV	HIGH VELOCITY
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HWBG	HOT WATER BELOW GRADE
HWOH	HOT WATER OVER HEAD
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IN-WG	INCHES-WATER GAGE
INSUL	INSULATION
IPS	IRON PIPE SIZE
IVS	ISOLATION VALVE STATION
IW	INDIRECT WASTE
J	
JT	JOINT
K	
KS	KITCHEN SINK
L	
L	LENGTH
LAV	LAVATORY
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LOW PRESSURE
LPD	LOW PRESSURE DRIP
LPR	LOW PRESSURE RETURN
LPG	LOW PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LV	LOW VELOCITY
LVG	LEAVING
LWCO	LOW WATER CUTOFF
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MPD	MEDIUM PRESSURE DRIP
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
MS	MINI-SPLIT SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MWT	MEAN WATER TEMPERATURE(ºF)
N	
N	NORTH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
ODS	OXYGEN DEPRIVATION SENSOR
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OFD	OVER FLOW DRAIN
OH	OVERHEAD
OPER	OPERATED
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OUT	OUTLET
OVC	OVERCURRENT
OVF	OVERFLOW
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP/PUMP
PE	PNEUMATIC - ELECTRIC
PG	PRESSURE DROP/PUMP DISCHARGE
PH	PHASE
PLBG	PLUMBING
PNL	PANEL
PR	PANEL RADIATOR
PRESS	PRESSURE
PRV	POWER ROOF VENTILATOR/PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	PRESSURE/TEMPERATURE TAP
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
RA	RELIEF/RETURN AIR
RAD	RADIATOR
RAF	RETURN AIR FIXTURES
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED/RECEIVED
REFRIG	REFRIGERANT
REG	REGISTER
REINF	REINFORCED
REQD	REQUIRED
RET	RETURN
REV	REVISION
RF	RETURN/RELIEF FAN
RH	REHEAT COIL
RHG	REFRIGERANT HOT
RL	REFRIGERANT LIQUID
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
RWC	RAIN WATER CONDUCTOR
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SDPR	SMOKE DAMPER
SENS	SENSIBLE
SEP	SEPARATOR
SF	SUPPLY FAN
SHT	SHEET
SK	SINK
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SPGR	SPECIFIC GRAVITY
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL UNIT
STAT	STATIC
STD	STANDARD
STL	STEEL
STR	STRAINER
SUP	SUPPLY
SV	SAFETY VALVE
SW	SWITCH
T	
TA	THROW AWAY
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TH	THERMOMETER
THK	THICK
TK	TANK
TMV	THRTMOSTATIC MIXING VALVE
TOT	TOTAL
TP	TRAP PRIMER/TRAP PRIMER SUPPLY
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
UC	UNDERCUT
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
V	
V	VOLTAGE/VALVE/VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VFS	VENTURI FLOW STATION
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THROUGH ROOF
W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WA	WATER HAMMER ARRESTER
Wb	WET BULB TEMPERATURE(ºF)
WC	WATER COLUMN/WATER CLOSET
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HEATER
WL	WATER LEVEL
WP	WEATHERPROOF
WT	WEIGHT
Y	
YCO	YARD CLEANOUT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PLUMBING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEMS AS INDICATED ON THE DRAWING, AS SPECIFIED, AND REQUIRED BY CODE.
2. RUN ALL SOIL WASTE AND VENT PIPING WITH 2% MIN. GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.
3. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.
5. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAINS VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
6. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (GREATER THAN 100 FEET) TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
7. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
8. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
9. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTIONS, NEAR THE BASE OF STACKS, EVERY 50'-0" IN HORIZONTAL RUN AND ELSEWHERE AS INDICATED.
10. ALL CLEANOUTS SHALL BE FULL SIZE OF PIPE FOR PIPE SIZES 4 INCHES AND SMALLER AND SHALL BE 4 INCHES FOR PIPE SIZES LARGER THAN 4 INCHES.
11. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOP (MEMORY STOPS).
12. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
13. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
14. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AS CLOSE TO THE EQUIPMENT AS POSSIBLE OR AS INDICATED ON THE DRAWINGS.
15. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER I.P.C. 2015. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
16. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING AND MAINTAIN PRESSURE TESTING DURING CONCRETE POURS.
17. PRESSURE TEST ALL DOMESTIC WATER PIPING w/ WATER. AIR TESTING IS NOT PERMITTED.
18. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
19. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.
20. EXTEND ALL VENTS THROUGH ROOF.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
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55 ER Path
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304-276-7151
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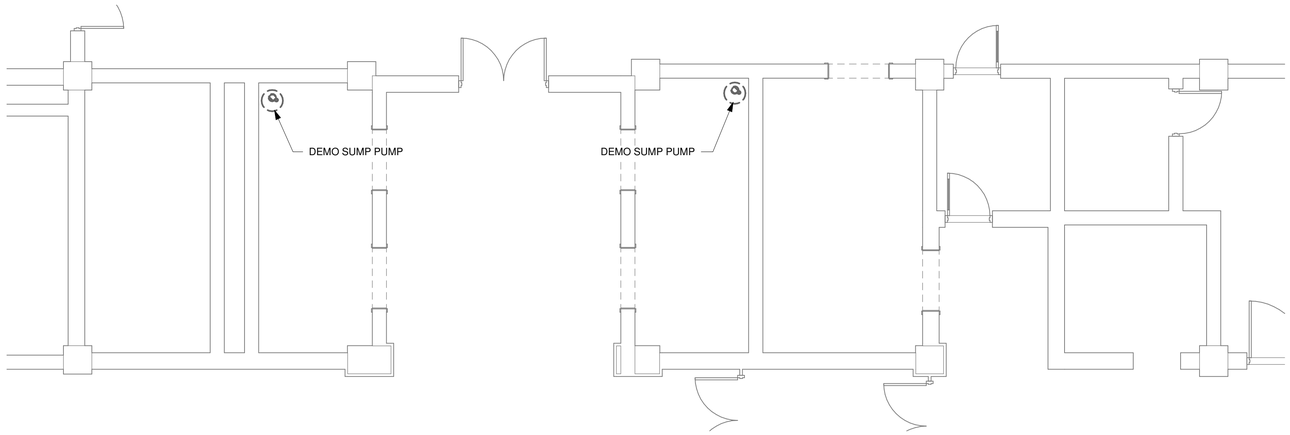
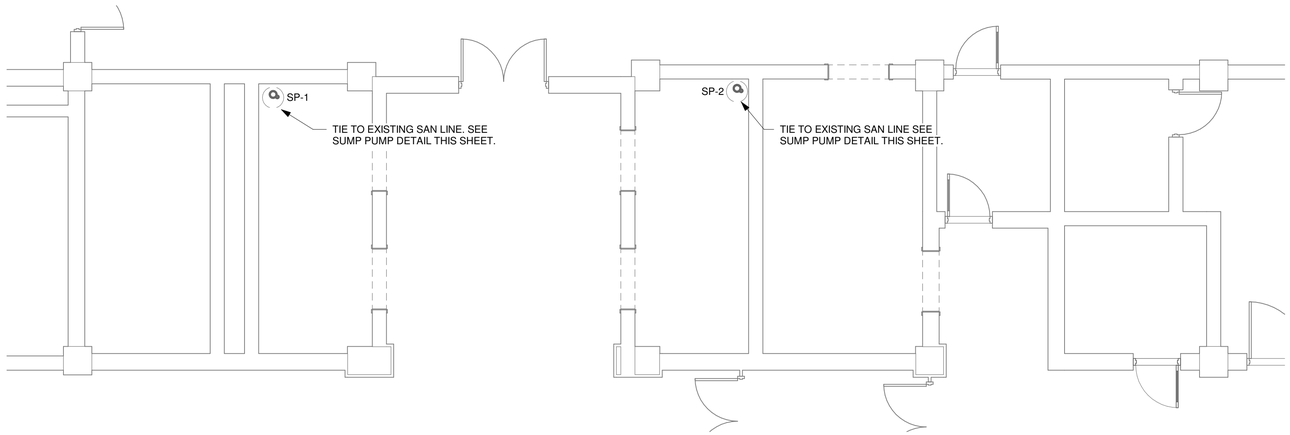


1 BASEMENT PLUMBING DEMOLITION PLAN

3/16" = 1'-0"



2 BASEMENT PLUMBING PLAN

3/16" = 1'-0"

SUMP PUMP SCHEDULE

TAG	SERVES	MFR	MODEL	FLOW RATE	HEAD	HP	PHASE	VOLTS	MCA	MOCP	COMMENTS
SP-1	ELEVATORS #3 & #4	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.
SP-2	ELEVATORS #1 & #2	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.

PLUMBING NOTES

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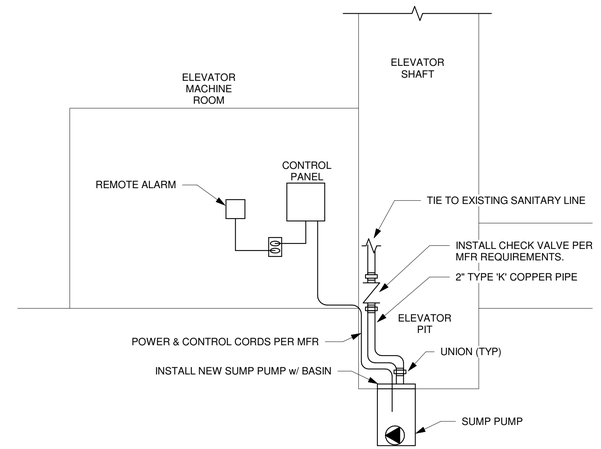
2. RUN ALL SOIL WASTE AND VENT PIPING WITH 2% MIN. GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.
3. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.
5. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAINS VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
6. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (GREATER THAN 100 FEET) TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
7. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
8. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
9. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTIONS, NEAR THE BASE OF STACKS, EVERY 50'-0" IN HORIZONTAL RUN AND ELSEWHERE AS INDICATED.
10. ALL CLEANOUTS SHALL BE FULL SIZE OF PIPE FOR PIPE SIZES 4 INCHES AND SMALLER AND SHALL BE 4 INCHES FOR PIPE SIZES LARGER THAN 4 INCHES.
11. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOP (MEMORY STOPS).
12. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
13. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
14. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AS CLOSE TO THE EQUIPMENT AS POSSIBLE OR AS INDICATED ON THE DRAWINGS.
15. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER I.P.C. 2015. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
16. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING AND MAINTAIN PRESSURE TESTING DURING CONCRETE POURS.
17. PRESSURE TEST ALL DOMESTIC WATER PIPING w/ WATER. AIR TESTING IS NOT PERMITTED.
18. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
19. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.
20. EXTEND ALL VENTS THROUGH ROOF.



3 SUMP PUMP DETAIL

DRAWING NOT SCALABLE

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
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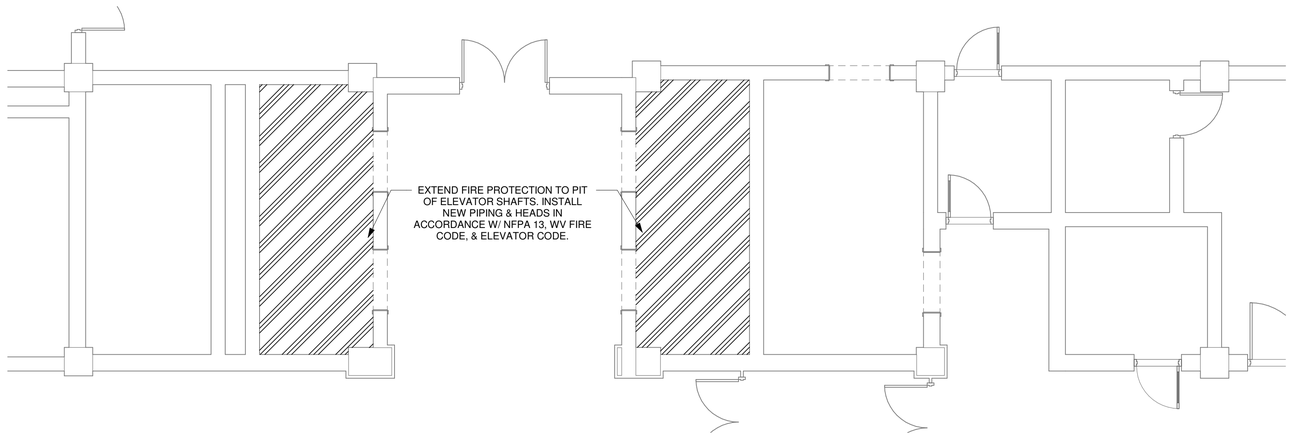
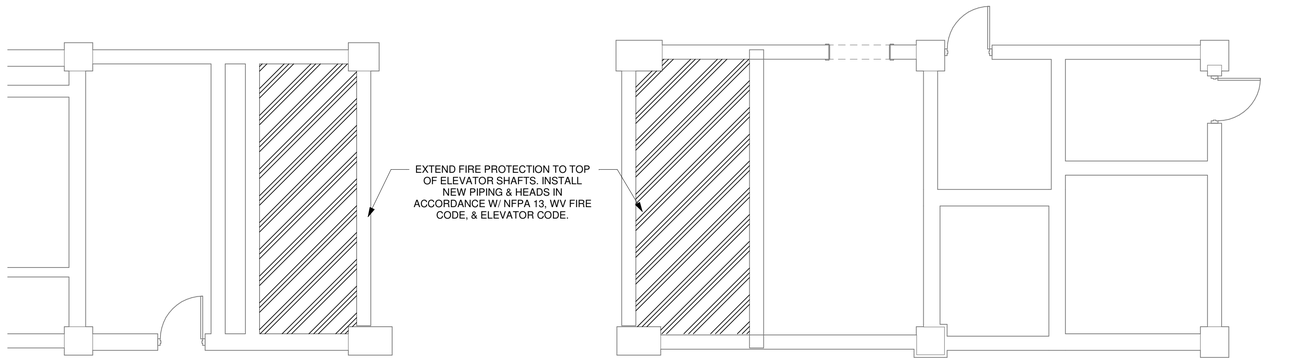
BUILDING #5 - DEMOLITION & NEW PLUMBING PLANS

P101-05



1 BASEMENT FIRE PROTECTION PLAN

3/16" = 1'-0"



2 ELEVENTH FLOOR FIRE PROTECTION PLAN

3/16" = 1'-0"

FIRE PROTECTION NOTES

1. PROVIDE FIRE PROTECTION SYSTEM DESIGN AND INSTALLATION AS NECESSARY TO MEET CODES, STANDARDS, AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ) AND INSURANCE UNDERWRITERS.
2. COORDINATE ALL WORK w/ OTHER TRADES PRIOR TO THE FABRICATION OR INSTALLATION OF ANY PIPING.
3. PROVIDE SYSTEM DEVICES, PIPING, AND COMPONENTS AS NECESSARY TO INSTALL A COMPLETE FIRE PROTECTION SYSTEM. THE EXISTING SYSTEM COMPONENTS AND PIPING MAY BE REUSED w/ THE APPROVAL OF THE AHJ.
4. RETAIN THE SERVICES OF A NICET LEVEL 4 SYSTEM DESIGNER TO DESIGN AND LAYOUT THE FULL SYSTEM AS NECESSARY TO MEET THE CURRENT NFPA, STATE, AND LOCAL REQUIREMENTS. ZONE THE FIRE PROTECTION SYSTEM AS NECESSARY. PROVIDE ALL DEVICES AS REQUIRED FOR THE INSTALLATION OF A COMPLETE, TEST INSPECTED, CODE COMPLIANT SYSTEM. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ.
5. SUBMIT DETAILED FIRE PROTECTION DRAWINGS, HYDRAULIC CALCULATIONS, & ALL ITEMS STATED ON THE ICC CHECKLIST TO THE CODE REVIEW OFFICIAL. AFTER THE APPROVAL OF THE CODE REVIEW OFFICIAL, SEND THE FIRE PROTECTION DRAWINGS & HYDRAULIC CALCULATIONS TO THE ARCHITECT & ENGINEER FOR APPROVAL.
6. DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR MUST FIELD VERIFY ACTUAL CONDITIONS AT THE SITE PRIOR TO PRECEDING w/ THE WORK.
7. COORDINATE w/ LOCAL UTILITY BOARD PRIOR TO THE START OF DESIGN. COPY DESIGN BASIS FLOW TEST DATA TO THE OWNER.
8. PROVIDE DEVICES AND INTERCONNECTION TO THE FIRE ALARM SYSTEM FOR ALL ZONING, NOTIFICATION, AND ALARM AS REQUIRED. COORDINATE w/ FIRE ALARM CONTRACTOR PRIOR TO BIDDING.
9. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF FIRE EXTINGUISHER CABINETS, FIRE HOSE CABINETS, AND SIAMESE CONNECTIONS.
10. CENTER HEADS IN CEILING TILES. VERIFY BEFORE INSTALLATION THE EXACT CEILING TYPE & PATTERN.
11. COORDINATE FINAL LOCATIONS OF SPRINKLER HEADS, PIPING, & ALL NEW WORK w/ LIGHT FIXTURES, DIFFUSERS, GRILLES, SMOKE DETECTORS, SPEAKERS, & OTHER CEILING MOUNTED DEVICES. MAKE MINOR MODIFICATIONS TO SUIT.
12. PROVIDE SLEEVES & FIRESTOP SEALANTS WHERE PIPES PENETRATE FIRE RATED FLOORS & WALLS. COMPLY w/ ASTM E-814 & UL 1479.
13. CONFORM TO ICC, FM, NFPA REQUIREMENTS AND/OR OWNER'S INSURANCE UNDERWRITER. OBTAIN PERMITS & REVIEW STAMPS FROM THE A.H.J.
14. PIPING TO BE TIED INTO THE NEAREST APPROPRIATELY SIZED PIPING ABOVE CEILING.
15. ALL CONTROL VALVES SHALL BE MONITORED.
16. THE SPRINKLER SYSTEM SHALL BE DESIGNED & SIZED BY THE SPRINKLER CONTRACTOR. THESE DOCUMENTS SHALL BE USED AS A GUIDE FOR INTENT ONLY. FAST RESPONSE SPRINKLER HEADS ARE TO BE USED WHERE POSSIBLE BY CODE. SPRINKLER CONTRACTOR SHALL INFORM & COORDINATE ALL ELECTRICAL & FIRE ALARM DEVICES w/ THE ELECTRICAL CONTRACTOR.
17. PRIOR TO BIDDING, CONTRACTOR IS TO FIELD VERIFY EXISTING FIRE PROTECTION SYSTEM & PIPING. EXISTING PIPING NEARBY MAY BE TAPPED & EXTENDED PROVIDED IT MEETS THE FLOW & PRESSURE REQUIREMENTS DETERMINED BY THE CONTRACTOR'S NICET 4 SYSTEM DESIGNER & APPROVED BY THE WVSFM'S OFFICE.
18. INSPECTOR'S TEST VALVES SHALL NOT DRAIN ONTO CONCRETE SIDEWALKS, PADS, OR CONCRETE PLAZA'S DUE TO STAINING. IF DRAINING TO GRASS AREA PROVIDE MEANS TO ELIMINATE MUD OF THEIR DEBRIS FROM SPLASHING ONTO BUILDING.

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

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Montum Architecture

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55 ER Path
Keyser, WV 26726
304-276-7151
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BUILDING #5 - NEW FIRE PROTECTION PLANS

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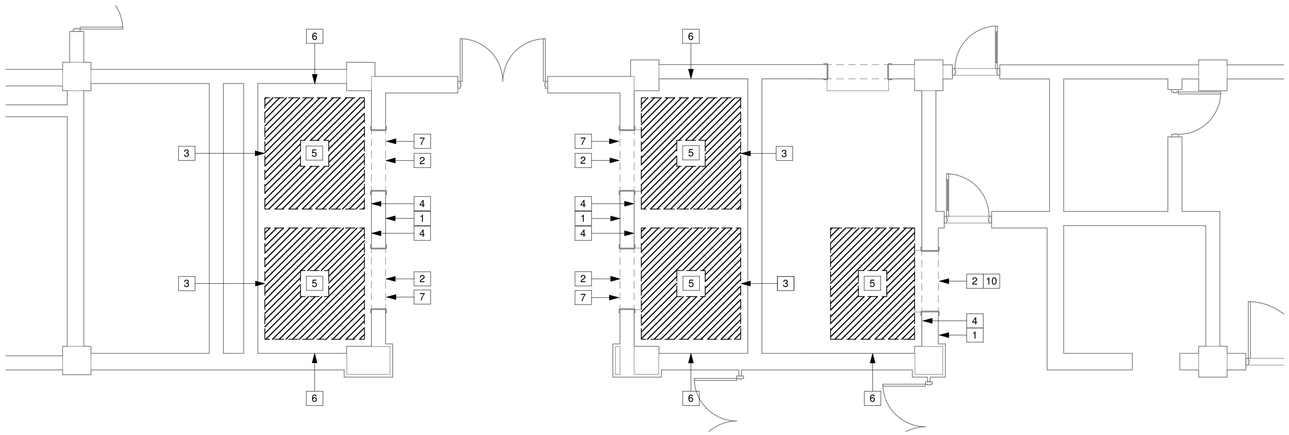
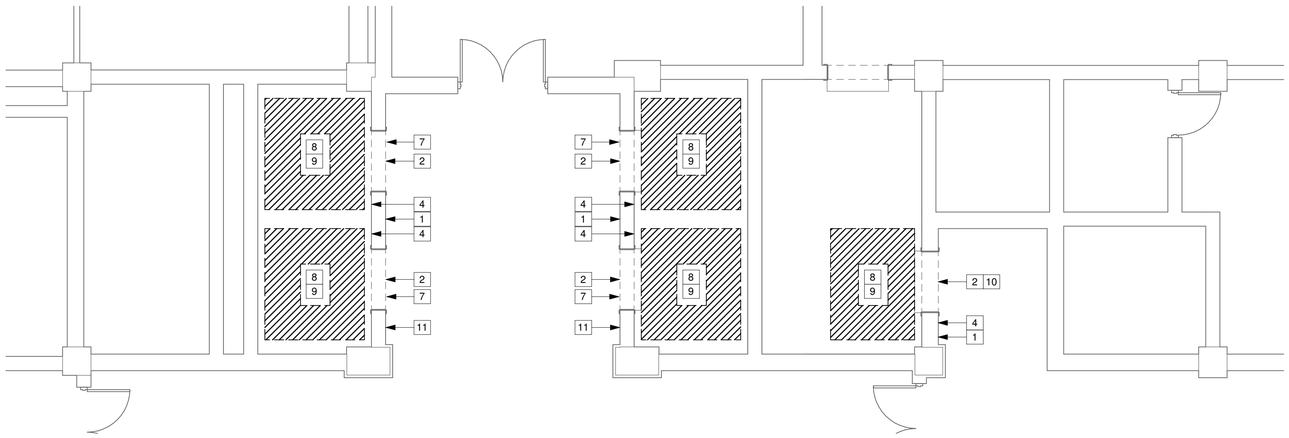


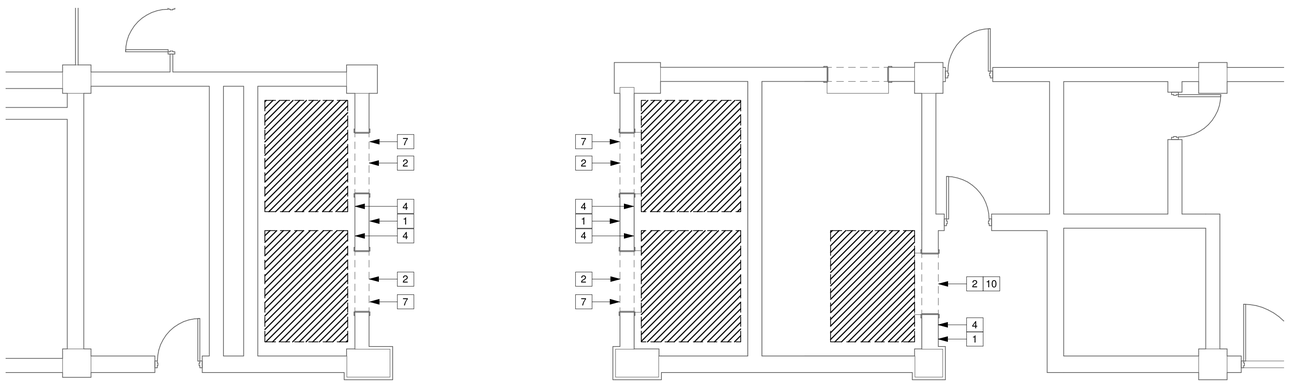
1 BASEMENT EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



2 FIRST FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



3 SECOND FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO HALL CALL.
2. DEMO HALL FLAGS.
3. DEMO EXISTING COUNTERWEIGHT RACK, BUFFER, CABLES, RAILING, ETC.
4. DEMO ALL CONTROL SYSTEM WIRING FOR COMPLETE REPLACEMENT, CONDUIT WIREWAY MAYBE RE-USED.
5. DEMO CAR BUFFER, PIT LADDER, CYLINDER, ETC.
6. DEMO COUNTERWEIGHT AND PLATFORM RAILS FOR REPLACEMENT BASED ON CONDITION.
7. DEMO HATCHWAY DOOR AND DOOR CARRIERS.
8. DEMO LIFT, CABLES, GOVERNOR CABLES, MESSENGER CABLES, ETC.
9. DEMO CAR, CAR ROOF AND WALL PANELS, PLATFORM, SLING, DO0R OPERATOR, ETC.
10. DEMO HATCHWAY DOOR. JAMBS ARE TO REMAIN.
11. DEMO FIREMAN'S HAT FOR REPLACEMENT.

KEY PLAN
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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
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CARMICHAELS, PA 15320
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55 ER Path
Keyser, WV 26726
304-276-7151
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BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS

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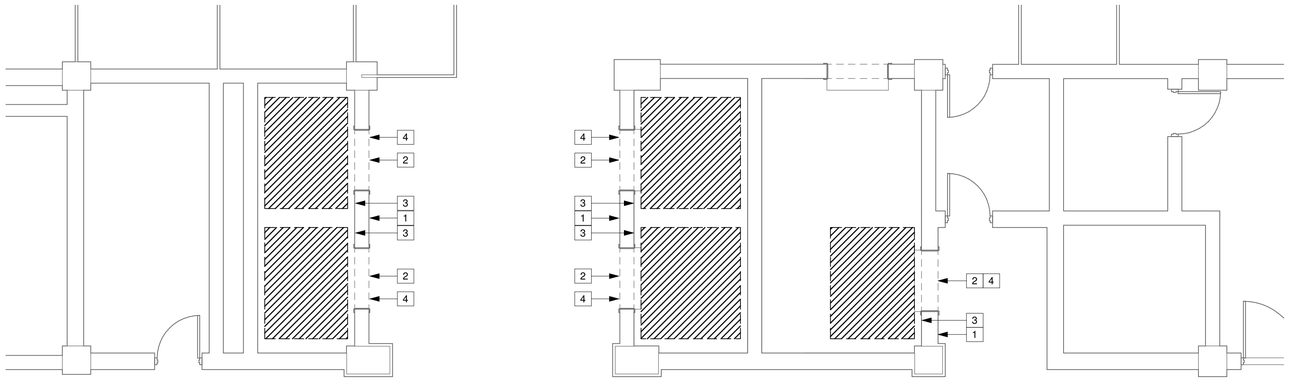
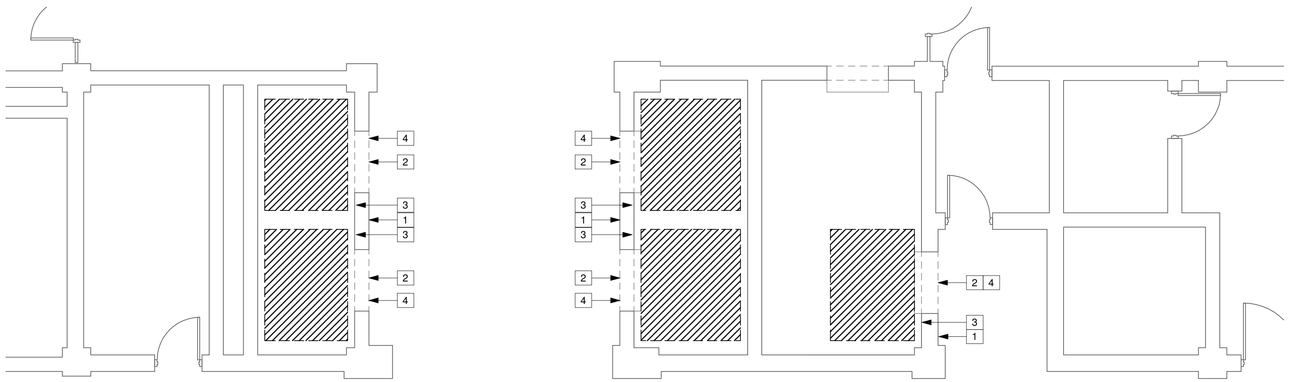


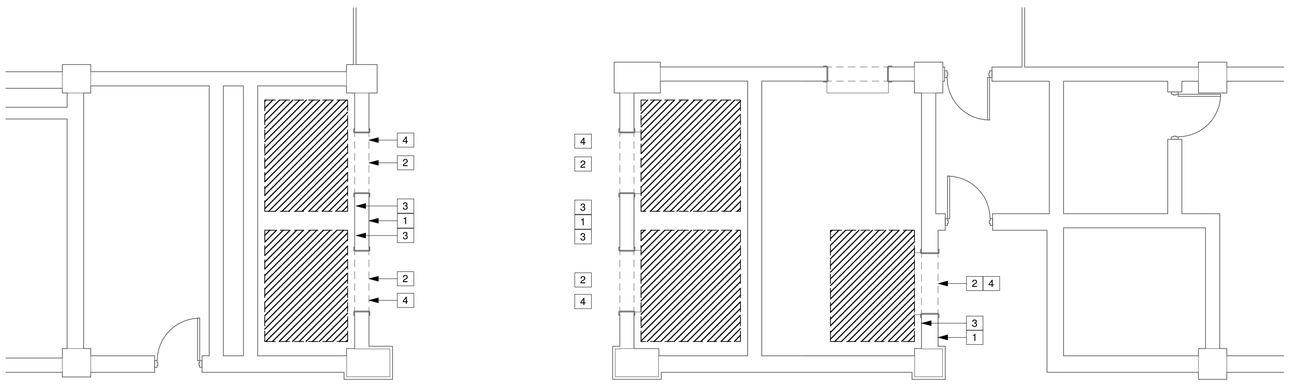
1 THIRD FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



2 FOURTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



3 FIFTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO HALL CALL.
2. DEMO HALL FLAGS.
3. DEMO ALL CONTROL SYSTEM WIRING FOR COMPLETE REPLACEMENT. CONDUIT WIREWAY MAYBE RE-USED.
4. DEMO HATCHWAY DOOR AND DOOR CARRIERS. JAMBS ARE TO REMAIN.

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MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

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BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS

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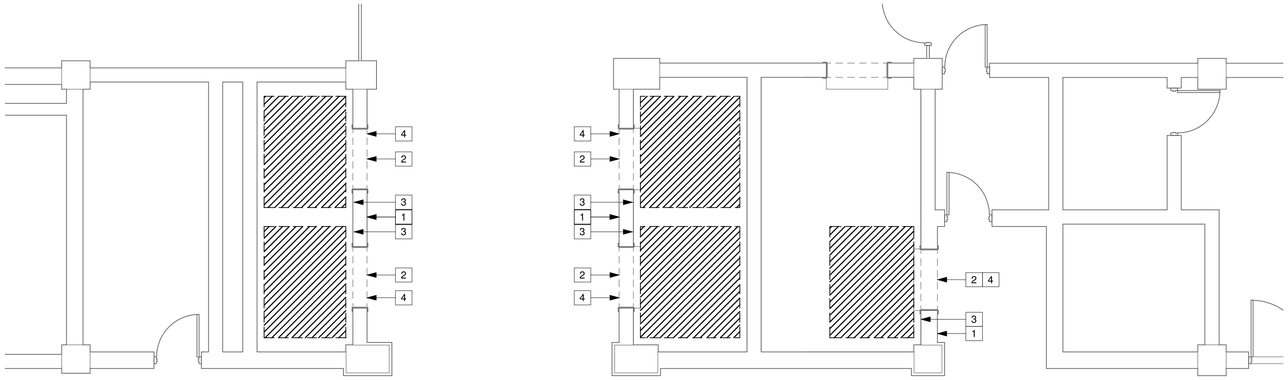
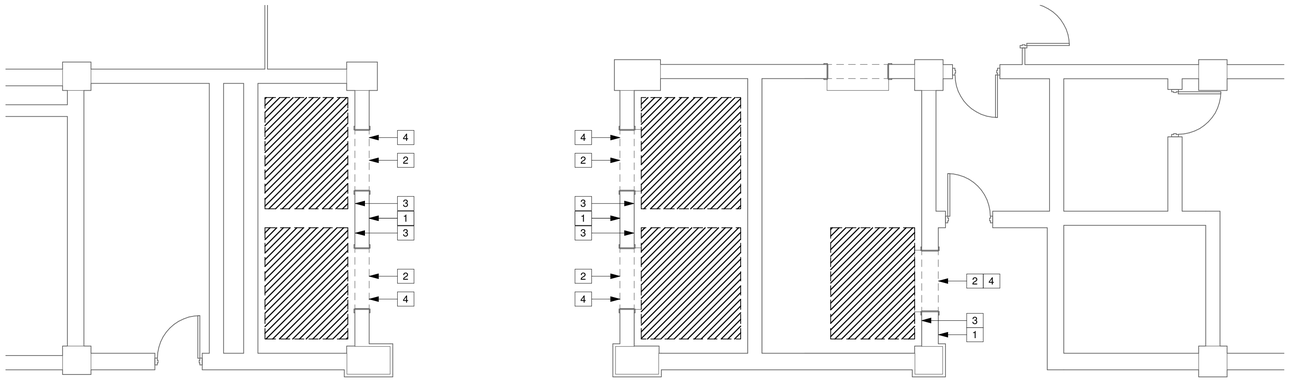


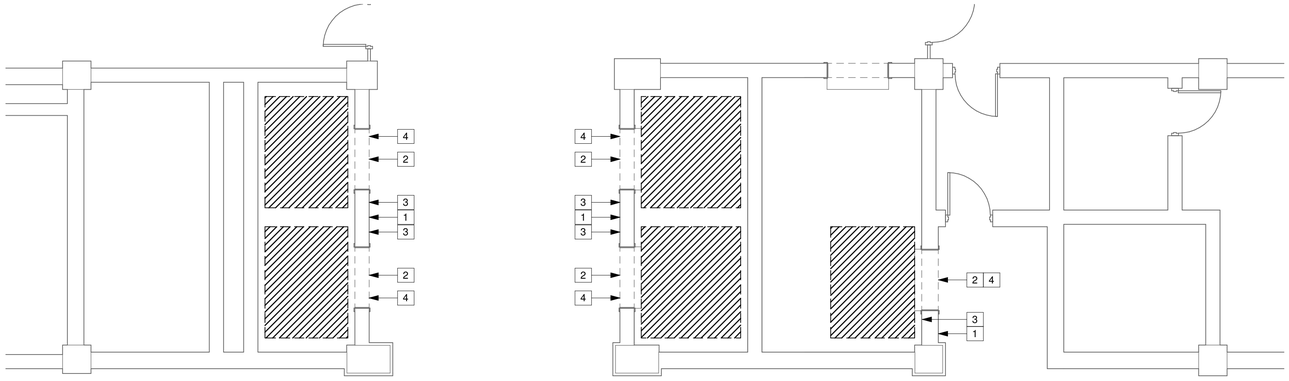
1 SIXTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



2 SEVENTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



3 EIGHTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO HALL CALL.
2. DEMO HALL FLAGS.
3. DEMO ALL CONTROL SYSTEM WIRING FOR COMPLETE REPLACEMENT. CONDUIT WIREWAY MAYBE RE-USED.
4. DEMO HATCHWAY DOOR AND DOOR CARRIERS. JAMBS ARE TO REMAIN.

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MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

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429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

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Montum Architecture

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55 ER Path
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BUILDING #5 - ELEVATOR EQUIPMENT DEMOLITION PLANS

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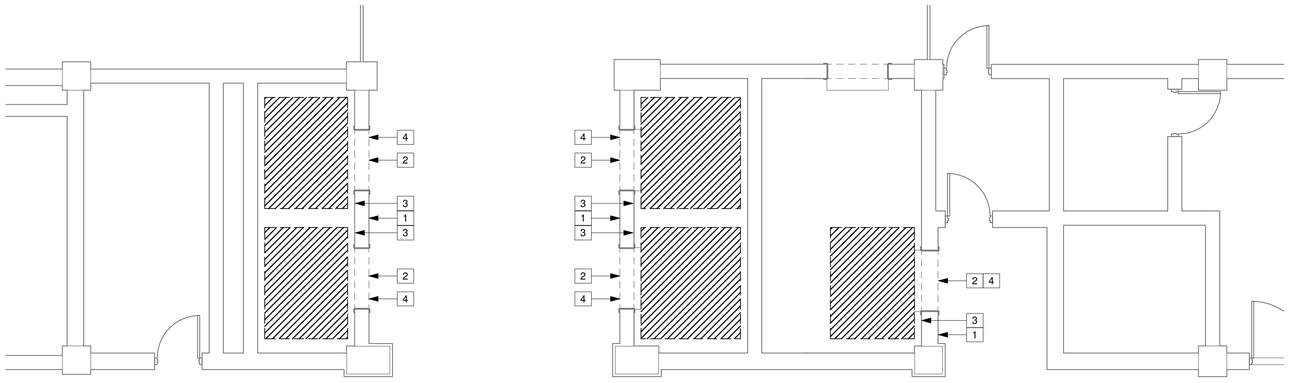
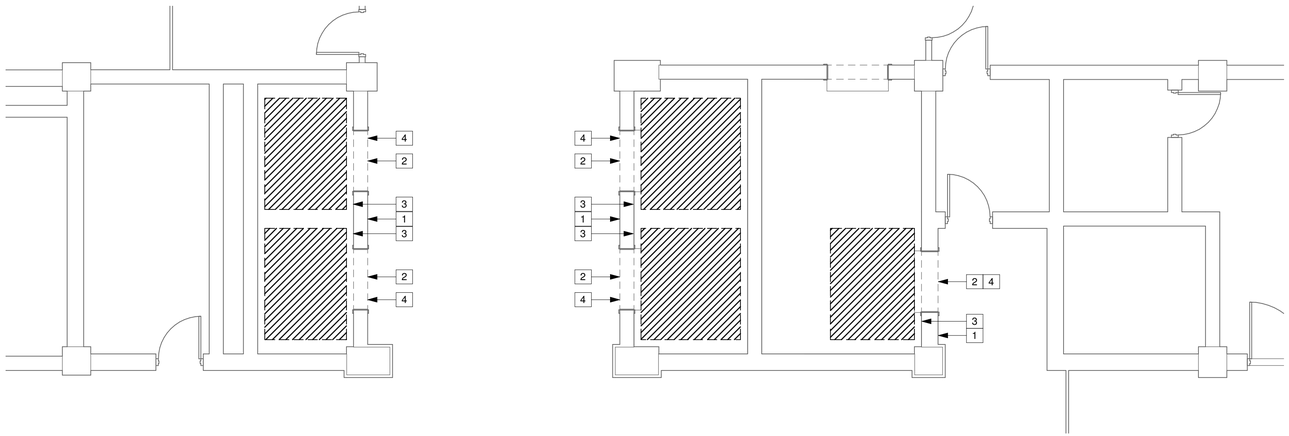


1 NINTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"



2 TENTH FLOOR EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO HALL CALL.
2. DEMO HALL FLAGS.
3. DEMO ALL CONTROL SYSTEM WIRING FOR COMPLETE REPLACEMENT. CONDUIT WIREWAY MAYBE RE-USED.
4. DEMO HATCHWAY DOOR AND DOOR CARRIERS. JAMBS ARE TO REMAIN.

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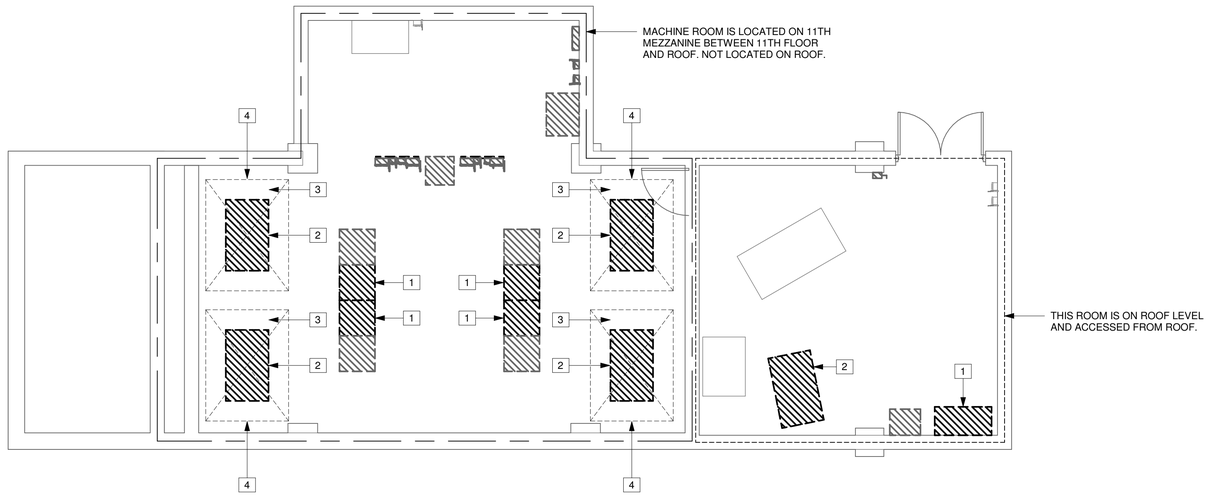

(2) ROOF/MEZZANINE EQUIPMENT DEMOLITION PLAN

3/16" = 1'-0"

SHEET NOTES

1. DEMO CONTROLLER AND ALL ASSOCIATED CONTROL WIRING.
2. DEMO ELEVATOR MACHINE, CABLING , ETC FOR COMPLETE REPLACEMENT.
3. DEMO FLYBALL GOVERNOR IN INTERSTITIAL BETWEEN TOP OF SHAFT AND MACHINE ROOM FLOOR, FOR REPLACEMENT. JAMBS ARE TO REMAIN.
4. DEMO GOVERNOR AND DEFLECTION SHEAVE IN MEZZANINE BELOW MACHINE ROOM FOR REPLACEMENT WITH NEW.

KEY PLAN

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WV OFFICE:
54 WEST RUN ROAD
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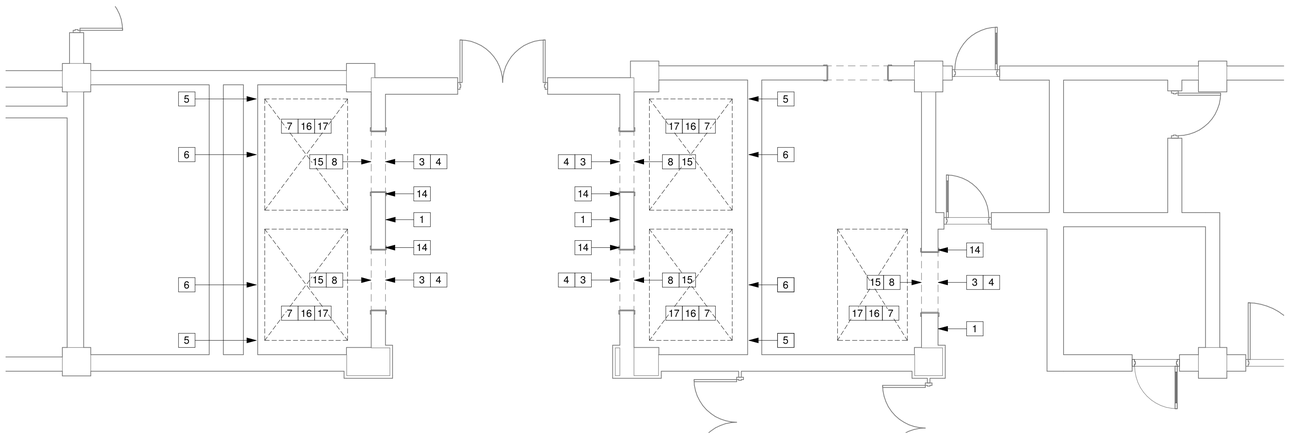

1 BASEMENT EQUIPMENT PLAN

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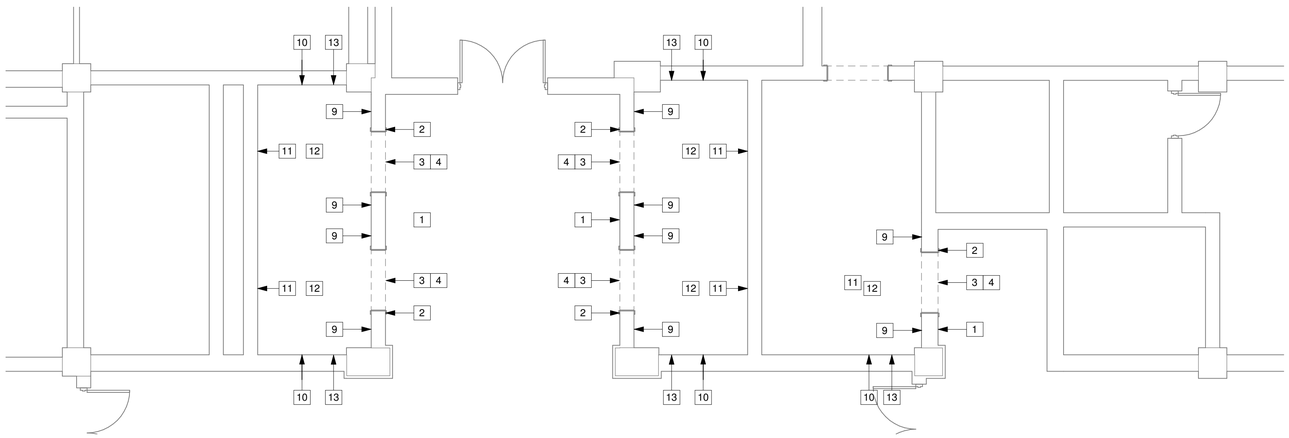
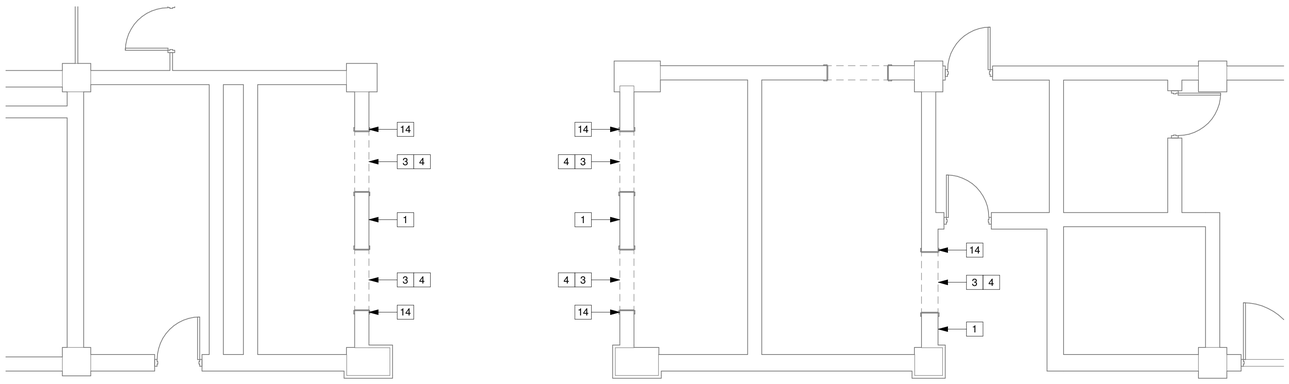


2 FIRST FLOOR EQUIPMENT PLAN

3/16" = 1'-0"

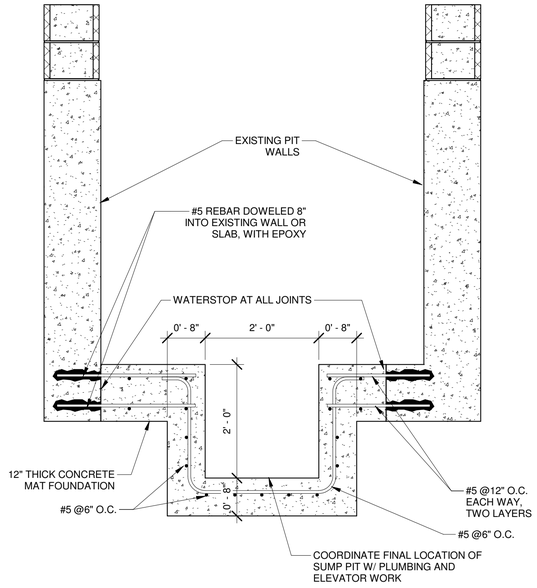


3 SECOND FLOOR EQUIPMENT PLAN

3/16" = 1'-0"

SHEET NOTES

1. INSTALL NEW HALL CALL w/ GONG TO MEET ADA.
2. STAINLESS STEEL JAMBS AND HEADERS TO BE THROUGHLY CLEANED AND POLISHED. VERIFY MATERIAL PRIOR TO BIDDING.
3. INSTALL NEW CAR FLOOR INDICATOR.
4. INSTALL NEW HATCH STAINLESS STEEL DOOR AND HEADER.
5. REPLACE ELEVATOR GUIDE RAILS AND MAKE SURE THEY'RE READY TO RECEIVE NEW SLING AND PLATFORM.
6. INSTALL NEW COUNTERWEIGHT SYSTEM INCLUDING RACK, ROLLER, WEIGHT, RAILING, AND BUFFER. PROVIDE COMPLIANT PERSONNEL SAFETY SCREENING IN PIT.
7. INSTALL NEW CAR BUFFER AND CYLINDER.
8. INSTALL NEW PIT LADDER AND STOP SWITCH.
9. INSTALL NEW CAR PANEL ON EACH SIDE OF DOOR. CAR CAB TO BE FURNISHED w/ ADA VIDEO PHONE.
10. INSTALL NEW ROLLERS, ETC.
11. INSTALL NEW HOIST CABLES, GOVERNOR CABLES, AND MESSENGER CABLE.
12. INSTALL NEW CAR SLING, PLATFORM, CAB WALLS AND ROOF, AND CAR DOOR.
13. INSTALL CAR POSITION TAPE.
14. JAMB AND HEADER ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, COLOR BY ARCHITECT. VERIFY MATERIAL PRIOR TO BIDDING.
15. PAN OFF TOE CATCH WITHIN HOISTWAY AS NECESSARY TO MEET ANSI STANDARDS.
16. APPLY XYPEX CONCENTRATE (OR SIMILAR) BASE COAT AND XYPEX MODIFIED (OR SIMILAR) TOP COAT ON VERTICAL AND HORIZONTAL SURFACES IN EXISTING ELEVATOR PITS BELOW THE BOTTOM FLOOR LEVEL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
17. INSTALL RETROFIT WATERSTOPS AT PATCHED CONCRETE WITHIN ELEVATOR PITS.



4 ELEVATOR PIT DETAIL

DRAWING NOT SCALABLE

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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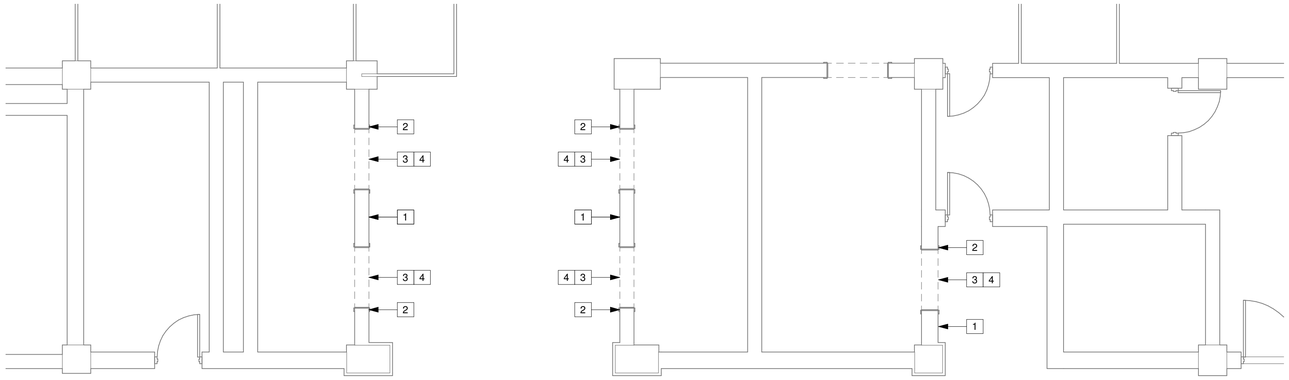
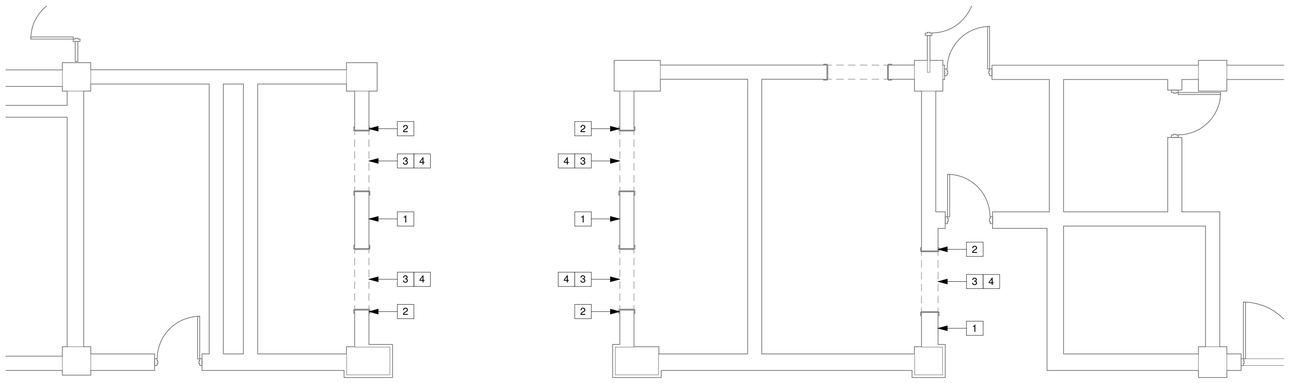
BUILDING #5 - ELEVATOR EQUIPMENT PLANS

Q101-05



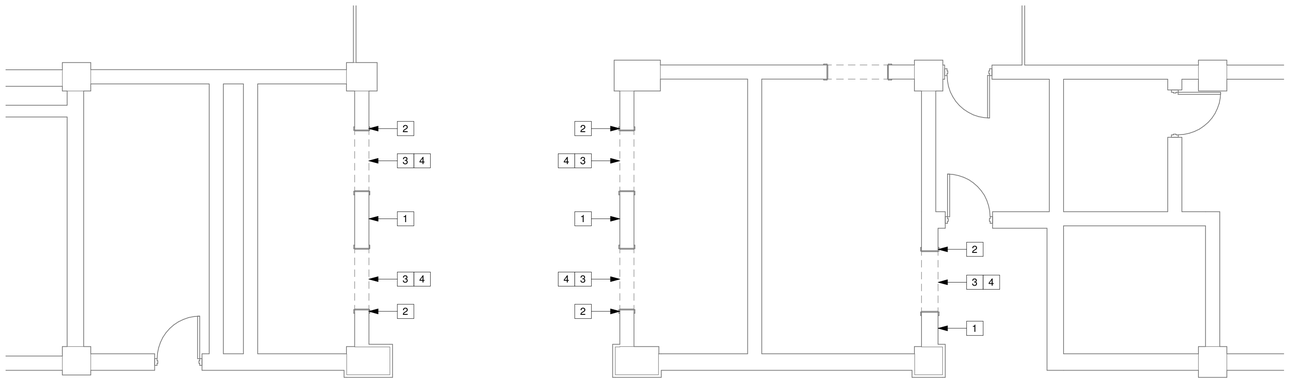
1 THIRD FLOOR EQUIPMENT PLAN

3/16" = 1'-0"



2 FOURTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"



3 FIFTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"

SHEET NOTES

1. INSTALL NEW HALL CALL w/ GONG TO MEET ADA.
2. JAMB AND HEADER ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, COLOR BY ARCHITECT. VERIFY MATERIAL PRIOR TO BIDDING.
3. INSTALL NEW CAR FLOOR INDICATOR.
4. INSTALL NEW HATCH DOOR AND HEADER.

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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
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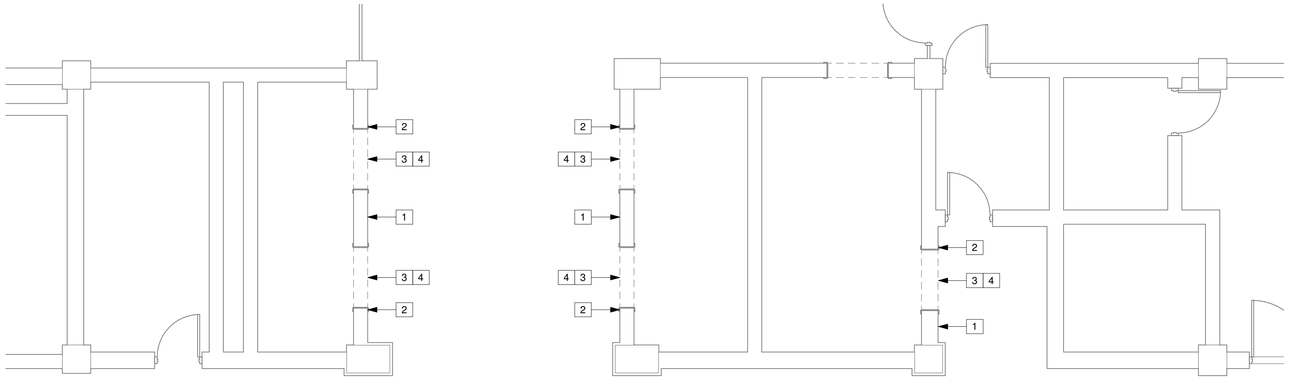
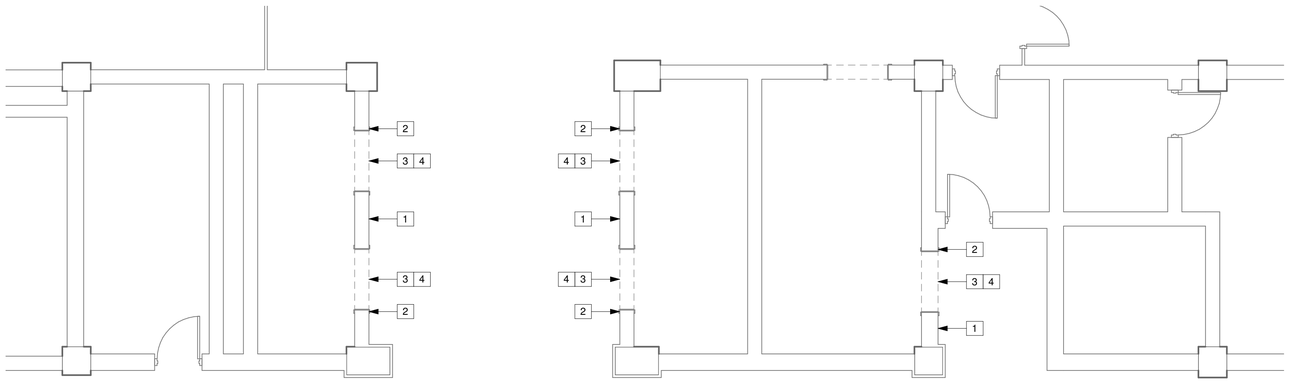
BUILDING #5 - ELEVATOR EQUIPMENT PLANS

Q102-05



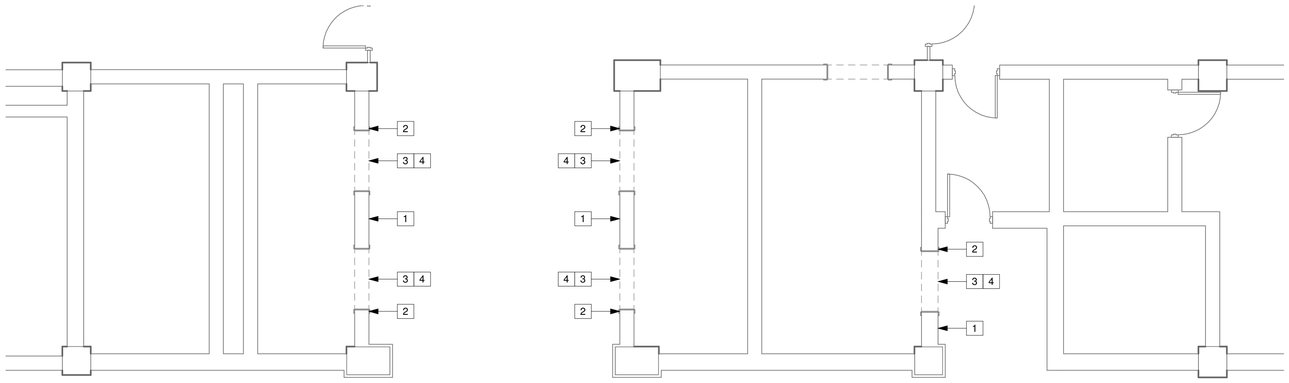
1 SIXTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"



2 SEVENTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"



3 EIGHTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"

SHEET NOTES

1. INSTALL NEW HALL CALL w/ GONG TO MEET ADA.
2. JAMB AND HEADER ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, COLOR BY ARCHITECT. VERIFY MATERIAL PRIOR TO BIDDING.
3. INSTALL NEW CAR FLOOR INDICATOR.
4. INSTALL NEW HATCH DOOR AND HEADER.

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54 WEST RUN ROAD
MORGANTOWN, WV 26508
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CARMICHAELS, PA 15320
PH: (724) 966-5655

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55 ER Path
Keyser, WV 26726
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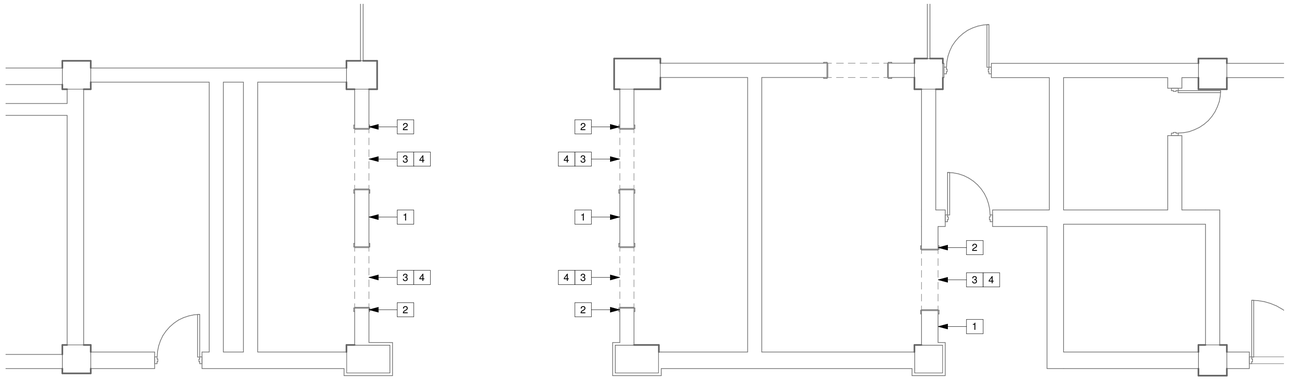
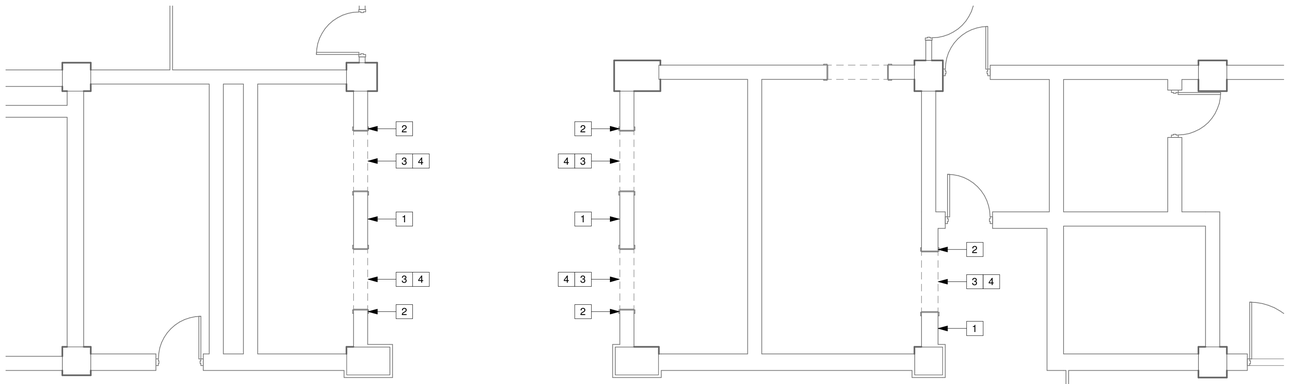
BUILDING #5 - ELEVATOR EQUIPMENT PLANS

Q103-05



1 NINTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"



2 TENTH FLOOR EQUIPMENT PLAN

3/16" = 1'-0"

SHEET NOTES

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2. JAMB AND HEADER ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, COLOR BY ARCHITECT. VERIFY MATERIAL PRIOR TO BIDDING.
3. INSTALL NEW CAR FLOOR INDICATOR.
4. INSTALL NEW HATCH DOOR AND HEADER.

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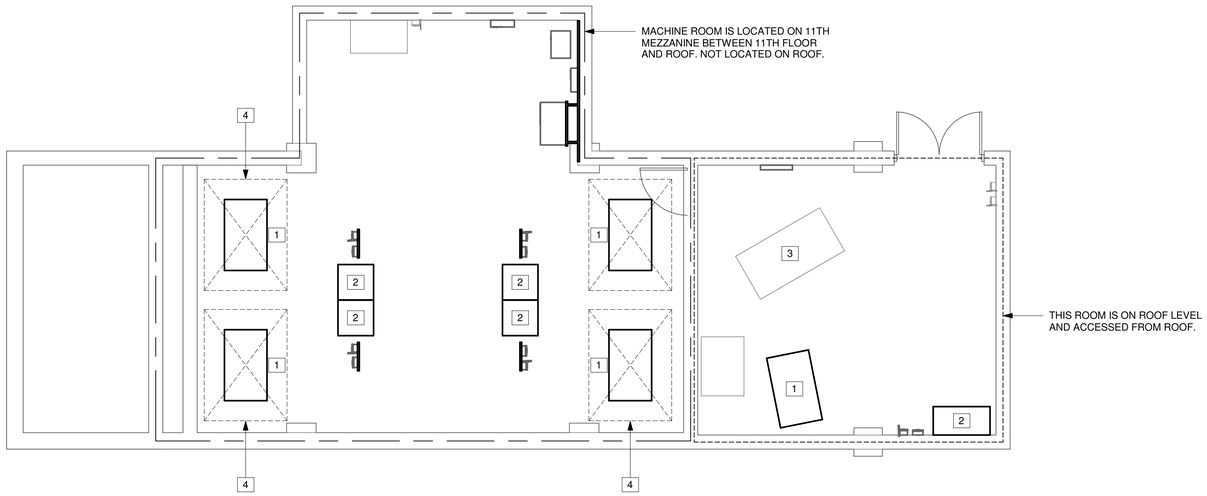
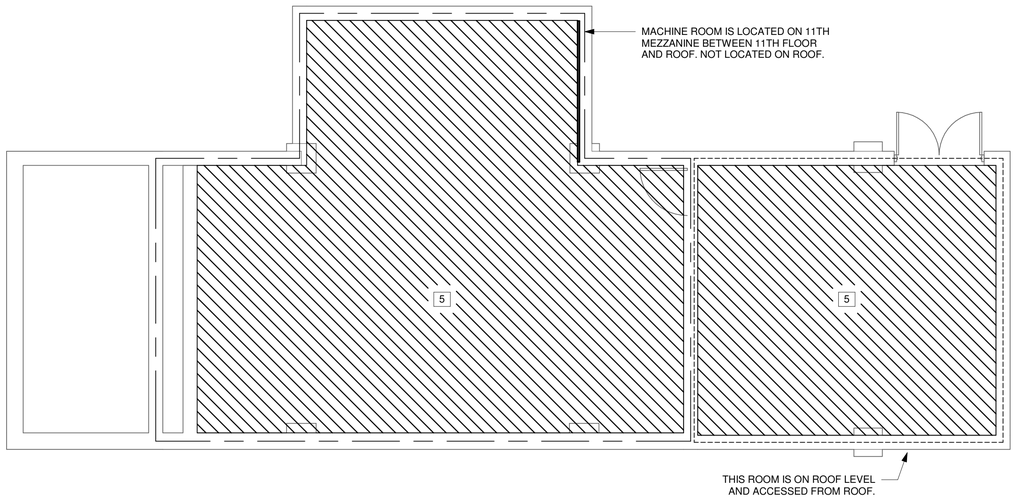
BUILDING #5 - ELEVATOR EQUIPMENT PLANS

Q104-05



1 ROOF/MEZZANINE EQUIPMENT PLAN

3/16" = 1'-0"



2 MACHINE ROOM FLOORING PLAN

3/16" = 1'-0"

SHEET NOTES

1. INSTALL NEW ELEVATOR MACHINE AND GOVERNOR INCLUDING INTERMEDIATE STEEL TO BEAR ON EXISTING HOISTING STEEL. CONFIRM BEARING CAPACITY OF EXISTING STEEL.
2. INSTALL NEW CONTROLLER.
3. ELEVATOR #5 AND EQUIPMENT NOT PART OF CONTRACT.
4. SHAFT MEZZANINE. INSTALL INTERLOCK SWITCHES ON ROLL UP DOORS TO SHAFT MEZZANINE.
5. GRIND FLOOR OF ANY OBSTRUCTIONS AND MAKE SMOOTH. PATCH AS NECESSARY.

KEY PLAN

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MORGANTOWN, WV 26508
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Montum Architecture

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55 ER Path
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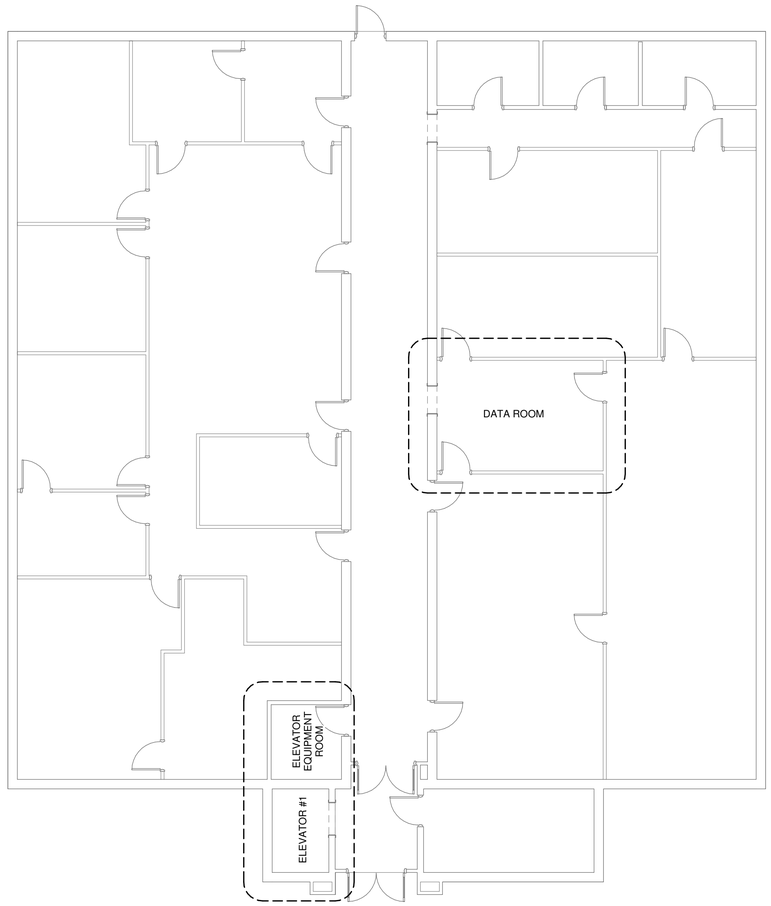
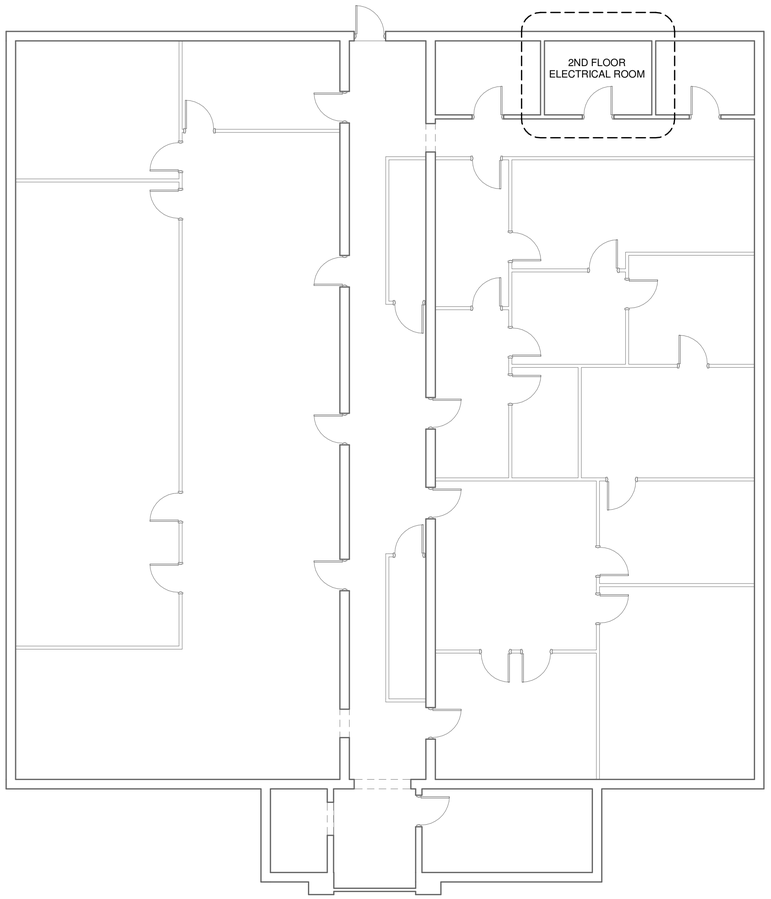


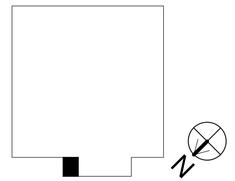
1 REFERENCE MASTER FLOOR PLAN - FIRST FLOOR

1/8" = 1'-0"



2 REFERENCE MASTER FLOOR PLAN - SECOND FLOOR

1/8" = 1'-0"



KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture

Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
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BUILDING #15 - GENERAL BUILDING LAYOUT

G000-15

MECHANICAL ABBREVIATIONS

SYMBOLS	
#	NUMBER
&	AND
°	DEGREES
ºF	DEGREES FAHRENHEIT
A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
AUX	AUXILIARY
AVG	AVERAGE
B	
BFV	BUTTERFLY VALVE
BH	BASEBOARD HEATER
BHP	BRAKE HORESPOWER
BLR	BOILER
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CHKV	CHECK VALVE
CIRC	CIRCULATING
CI	CAST IRON
CKT	CIRCUIT
CMU	CONCRETE MASONARY UNIT
C/O	CLEAN OUT
CON	CONDENSATE
CONT	CONTINUATION
CT	COOLING TOWER
CU	CONDENSING UNIT
D	
DIA	DIAMETER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE(ºF)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE(ºF)
F	
ºF	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	
GAS	NATURAL GAS
GALV	GALVANIZED
GA	GAUGE
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	
HCWL	HYDRONIC CHILLED WATER LOOP
HCWR	HYDRONIC CHILLED WATER RETURN
HCWS	HYDRONIC CHILLED WATER SUPPLY
HHWL	HYDRONIC HOT WATER LOOP
HHWR	HYDRONIC HOT WATER RETURN
HHWS	HYDRONIC HOT WATER SUPPLY
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
J	
JB	JUNCTION BOX
K	
KW	KILOWATT
KWH	KILOWATT HOUR
L	
LAT	LEAVING AIR TEMPERATURE(ºF)
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LIQUID PROPANE
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MS	MINI-SPLIT SYSTEM
N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
Q	
QTY	QUANTITY
R	
RA	RETURN AIR
RAD	RADIATOR
RCP	RADIANT CEILING PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SMOKE DAMPER
SENS	SENSIBLE
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T	
T	THERMOSTATE
TA	TRANSFER AIR
TCV	TEMPERATURE CONTROL VALVE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TSTAT	THERMOSTAT
TV	TURNING VANES
TYP	TYPICAL
U	
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	
VOLTS	VOLTAGE
VA	VOLT AMPERES
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VOLTS	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VVT	VARIABLE VOLUME AND TEMPERATURE
W	
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WT	WEIGHT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, SPECIFICATIONS, AND REQUIRED BY CODE.
2. PROVIDE BALL VALVE STOPS AT ALL FIXTURES. PROVIDE UNIONS, DIRT LEGS, AND REGULATORS ON ALL EQUIPMENT.
3. COORDINATE ALL STUB-UPS AND FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS.
4. PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN THE HEATING WATER, CHILLED WATER, AND OTHER CLOSED WATER PIPING SYSTEMS. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT BOTTOM OF RISERS AND LOW POINTS.
5. UNLESS OTHERWISE NOTED, ALL PIPING IS TO BE OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OR DECK w/ SPACE FOR INSULATION.
6. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, ETC. ARE ACCESSIBLE.
7. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MANUAL ADJUSTABLE STOPS.
8. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.
9. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
10. ALL PIPING SHALL CLEAR DOORS AND WINDOWS. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
11. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
12. PROVIDED FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS.
13. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERNATIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, APPLICABLE LOCAL CODES, LOCAL UTILITY REQUIREMENTS, AND THE INTERNATIONAL FUEL GAS CODE.
14. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ECT. IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
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CARMICHAELS, PA 15320
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WEST VIRGINIA
GENERAL SERVICES
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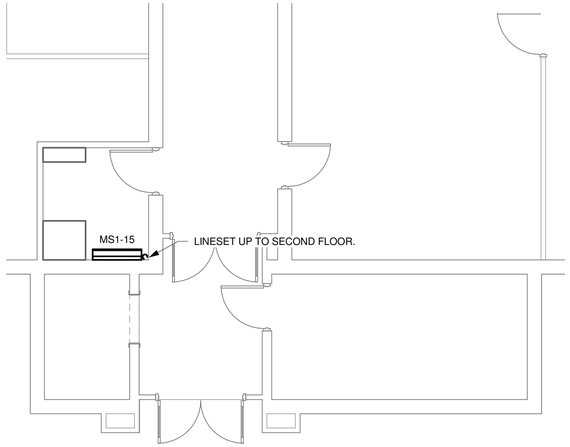
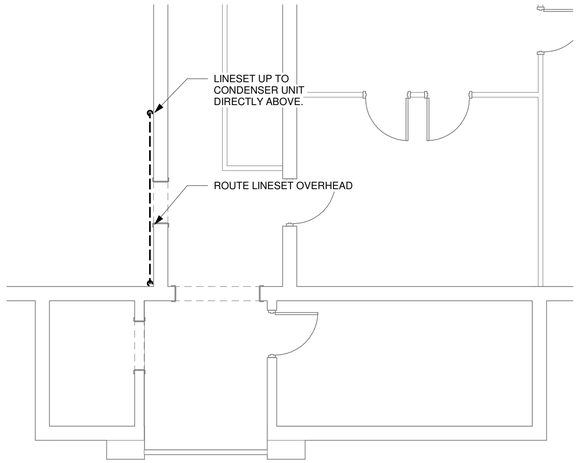
BUILDING #15 -
MECHANICAL
ABBREVIATIONS

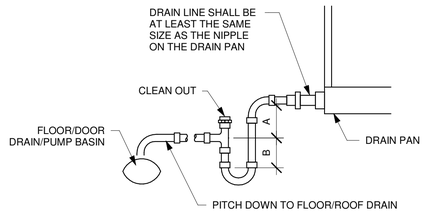
M000-15



1 FIRST FLOOR MECHANICAL PLAN
3/16" = 1'-0"



4 SECOND FLOOR MECHANICAL PLAN
3/16" = 1'-0"



UNIT TYPE	A	B
DRAW THROUGH	P+1"	P
BLOW THROUGH	2" MIN.	2P

P = STATIC PRESSURE OF UNITS IN INCHES OF H20

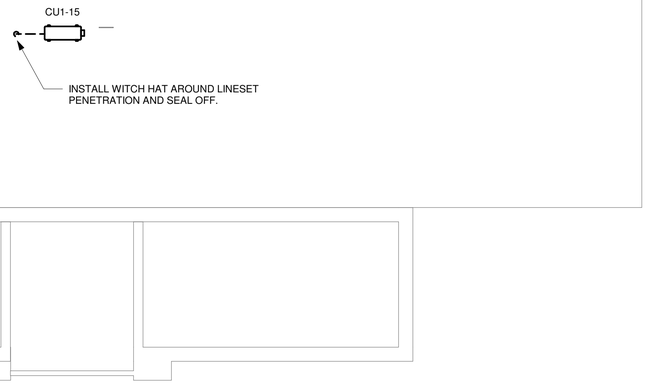
2 CONDENSATE DRAIN DETAIL
DRAWING NOT SCALABLE

MINI-SPLIT UNIT SCHEDULE

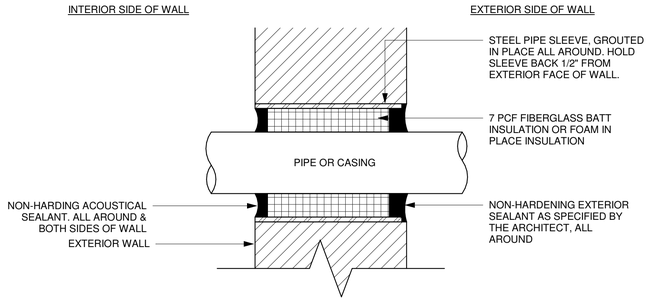
MARK	MANUFACTURER	MODEL	SYSTEM SERVED	COOLING CAPACITY	ELECTRICAL DATA	
					VOLTAGE	PHASE
MS1-15	CARRIER	40MHHC18---3	CU-1	18,000 Btu/h	208 V	1

CONDENSER UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SYSTEM SERVED	COOLING CAPACITY	ELECTRICAL DATA			
					VOLTAGE	PHASE	MCA	MOCP
CU1-15	CARRIER	38MHRBC18AA3	MS-1	18,000 Btu/h	208 V	1	15.0 A	20 A



5 ROOF MECHANICAL PLAN
3/16" = 1'-0"

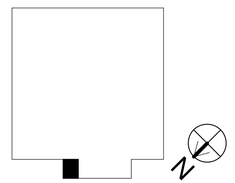


GENERAL NOTES:
1. WHERE EXPOSED TO ROOM, PROVIDE ESCUTCHEON TRIM.
2. NO MORTAR BRIDGING BETWEEN PIPE & CMU. NO CONCRETE BRIDGING ON POURED WALLS.
3. SUPPORT PIPE TO PREVENT CONTACT w/ SLEEVE.

3 EXTERIOR WALL PENTRATION DETAIL
DRAWING NOT SCALABLE

PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, SPECIFICATIONS, AND REQUIRED BY CODE.
2. PROVIDE BALL VALVE STOPS AT ALL FIXTURES. PROVIDE UNIONS, DIRT LEGS, AND REGULATORS ON ALL EQUIPMENT.
3. COORDINATE ALL STUB-UPS AND FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS.
4. PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN THE HEATING WATER, CHILLED WATER, AND OTHER CLOSED WATER PIPING SYSTEMS. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT BOTTOM OF RISERS AND LOW POINTS.
5. UNLESS OTHERWISE NOTED, ALL PIPING IS TO BE OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OR DECK w/ SPACE FOR INSULATION.
6. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, ETC. ARE ACCESSIBLE.
7. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MANUAL ADJUSTABLE STOPS.
8. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.
9. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
10. ALL PIPING SHALL CLEAR DOORS AND WINDOWS. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
11. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
12. PROVIDED FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS.
13. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERNATIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, APPLICABLE LOCAL CODES, LOCAL UTILITY REQUIREMENTS, AND THE INTERNATIONAL FUEL GAS CODE.
14. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ECT. IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:
CONSTRUCTION DOCUMENTS

NO.	DESCRIPTION	DATE

PROJECT NUMBER:	19006
ORIGINAL PAGE SIZE:	22x34
DESIGNED BY:	BCM
DRAWN BY:	JMM
CHECKED BY:	BCM

SHEET NAME:
BUILDING #15 - NEW MECHANICAL PLAN

M101-15

ELECTRICAL ABBREVIATIONS

1P	SINGLE POLE
1PH	SINGLE-PHASE
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3WAY	THREE-WAY
4/C	FOUR-WIRE
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4WAY	FOUR-WAY
4W	FOUR-WIRE
ø	PHASE
A	
A	AMPERE
AC	ALTERNATING CURRENT; ARMORED CABLE
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
A/E	ARCHITECT/ENGINEER
AFC	ABOVE FINISHED COUNTER
AFCI	ARC FAULT CIRCUIT INTERUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANN	ANNUNCIATOR
APPD	APPROVED
APPROX	APPROXIMATELY; APPROXIMATE
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING; AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
ATTN	ATTENTION
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AVG	AVERAGE
AWG	AMERICAN WRE GAUGE
B	
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BFF	BELOW FINISHED FLOOR
BG	BELOW GRADE
BKBD	BACKBOARD
BLDG	BUILDING
BLT	BUILT
BLW	BELOW
BOT	BOTTOM
BPS	BOLTED PRESSURE SWITCH
BRKR	BREAKER
BSMT	BASEMENT
BTWN	BETWEEN
BX	INTERLOCKED ARMORED CABLE
BYP	BYPASS
C	
C	CELSIUS
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION SYSTEM
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CD	CANDELA; CONSTRUCTION DOCUMENTS;
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CIR	CIRCLE
CKT	CIRCUIT
C	CENTERLINE
CL	CURRENT LIMITING; CENTER LINE; CLASS; CLOSE
CLG	CEILING
CLR	CLEAR
CND	CONDUIT
COAX	COAXIAL
COL	COLUMN
COMB	COMBINATION; COMBINED
COMM	COMMUNICATION
COMPR	COMPRESSOR
CONC	CONCRETE
CONN	CONNECT
CORR	CORRIDOR; CORRECT
CP	CONTROL PANEL
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTR	CENTER
CTRL	CONTROL
CU	COPPER; COEFFICIENT OF UTILIZATION; CUBIC
CU FT	CUBIC FEET
CUR	CURRENT
D	
D	DEPTH
DB	DIRECT BURIAL / DECIBEL
DBL	DOUBLE
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DEL	DELETE; DELIVER
DEMO	DEMOLITION; DEMONSTRATION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM; DIAGONAL
DIFF	DIFFERENCE
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE; DISTRICT
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION; DIVIDE
DN	DOWN
DOC	DOCUMENT
DPDT	DOUBLE POLE; DOUBLE THROW
DPST	DOUBLE POLE; SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING
E	
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ELR	END OF LINE RESISTOR
EM	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENGR	ENGINEER
ENGY	ENERGY
ENT	ELECTRICAL NONMETALLIC TUBING
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EST	ESTIMATE
ESTB	ESTABLISH
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION; EXPOSED; EXPAND
EXT	EXTERIOR; EXTERNAL
EXTN	EXTENSION
F	
F	FAHRENHEIT; FEMALE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FOOT-CANDLE
FCU	FAN COIL UNIT
FDR	FEEDER
FIN	FINISH
FIN GR	FINISH GRADE
FIXT	FIXTURE
FL MT	FLUSH MOUNT
FLEX	FLEXIBLE
FLG	FLOORING
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FREQUENCY MODULATION
FP	FIREPROOF
FR	FIRE RESISTANT
FREQ	FREQUENCY
FS	FUSIBLE SWITCH; FLOW SWITCH
FSC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET; FIRE TREATED; FOOT
FU	FUSE
FU SW	FUSED SWITCH
FURN	FURNISH; FURNACE; FURNITURE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL; GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GOVT	GOVERNMENT
GRN	GROUND
GYP	GYPSUM
H	
HDW	HARDWARE
HF	HIGH FREQUENCY
HID	HIGH INTENSITY DISCHARGE
HO	HOLD OPEN
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER; HEAT PUMP; HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ; FREQUENCY IN CYCLES PER SECOND
I	
ID	INSIDE DIAMTER; INSIDE DIMENSION; IDENTIFICATION
ILLUM	ILLUMINATION
IMC	INTERMEDIATE METAL CONDUIT
INFO	INFORMATION
INSUL	INSULATION
INTERCOM	INTERCOMMUNICATION
INTL	INTERNATIONAL
IR	INFRARED; INSIDE RADIUS
IT	INFORMATION TECHNOLOGY
J	
JB	JUNCTION BOX
K	
KCMIL	THOUSAND CIRCULAR MILS
KHz	KILOHERTZ
KIT	KITCHEN
KO	KNOCKOUT
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kVAh	KILOVOLT AMPERE PER HOUR
kVAR	KILOVAR; KILOVOLT AMPERE REACTIVE
kW	KILOWAT
kWh	KILOWATT HOURS
L	
L	LITER; ANGLE
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LM	LUMEN
LOC	LOCATION
LP	LIGHT POLE; LOW PRESSURE
LPW	LUMENS PER WATT
LT	LIGHT
LT SW	LIGHT SWITCH
LTD	LIMITED
LTG	LIGHTING
LV	LOW VOLTAGE
M	
M	METER
mA	MILLIAMPERE
MACH	MACHINE
MAG	MAGNET
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMIM
MC	MECHANICAL CONTRACTOR; METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MED	MEDICAL; MEDIUM
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MH	MANHOLE; METAL HALIDE
MHZ	MEGAHERTZ
MI	MINERAL INSULATED
MIC	MICROPHONE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOA	MULTIOUTLET ASSEMBLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MODIFY; MODULE
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MEETING; MOUNTING
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MULT	MULTIPLE
mV	MILLIVOLT
MVA	MEGAVOLT-AMPERE
MW	MEGAWATT; MICROWAVE
mW	MILLIWATT
MWH	MEGAWATT HOUR
N	
N	NORTH
NC	NORMALLY CLOSED
NE	NORMAL EMERGENCY
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN; NUMBER
NORM	NORMAL
NTS	NOT TO SCALE
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OH	OVERHEAD
OL	OVERLOAD ELEMENT
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OVC	OVERCURRENT
P	
P	POLE (S); PILOT
PA	POWER AMPLIFIER; PUBLIC ADDRESS
PART	PARTIAL
PB	PULL BOX; PANEL BOARD; PANIC BAR; PUSH-BUTTON
PC	PLUMBING CONTRACTOR; PIECE
PE	PHOTOELECTRIC, PNEUMATIC ELECTRIC
PEN	PENETRATE
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PLBG	PLUMBING
PNL	PANEL
POS	POSITION; POSITIVE
PP	POWER POLE
PR	PAIR
PRELIM	PRELIMINARY
PREP	PREPARATION
PRESS SW	PRESSURE SWITCH
PREV	PREVIOUS
PRI	PRIMARY
PROJ	PROJECT
PS	PULL STATION
PT	POTENTIAL TRANSFORMER
PVC	POLYVINAL CHLORIDE (PLASTIC)
PWR	POWER
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QTY	QUANTITY
QUAL	QUALITY
R	
R	RELAY; RADIUS
R/W	RIGHT OF WAY
RC	REMOTE CONTROL
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RCPT	RECEPTACLE
REF	REFRIGERATOR; REFERENCE
REINF	REINFORCED
REPL	REPLACE
REQD	REQUIRED
REV	REVISION; REVOLUTIONS
RFI	REQUEST FOR INFORMATION
RFP	REQUEST FOR PROPOSAL
RH	RIGHT HAND
RHC	REHEAT COIL
ROW	RIGHT OF WAY
RS	RAPID START
RTG	RATING
RTU	ROOF TOP UNIT
S	
S/S	START / STOP
SAMP	SAMPLE
SCHED	SCHEDULE
SCHEM	SCHEMATIC
SD	SMOKE DETECTOR
SDMPR	SMOKE DAMPER
SEC	SECONDARY
SECT	SECTION
SEP	SEPARATE
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SMR	SURFACE MOUNTED RACEWAY
SNSR	SENSOR
SOLV	SOLENOID VALVE
SPDT	SINGLE POLE; DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPLY	SUPPLY
SPST	SINGLE POLE; SINGLE THROW
SQ	SQUARE
SS	STAINLESS STEEL
ST	SINGLE THROW; STAIRS; STREET
ST PR	STATIC PRESSURE
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STARTER; STRAIGHT; STRIKE; STRINGERS
STRB	STROBE
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLEMENTARY
SUPVR	SUPERVISOR
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH; SIDEWALK
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL
SYS	SYSTEM
T	
T&M	TIME AND MATERIAL
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRU	THROUGH
TL	TWIST LOCK
TOC	TOP OF CONCRETE; TOP OF CURB
TOL	TOLERANCE
TP	TWISTED PAIR; TELEPHONE POLE
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TV	TELEVISION
TVOUT	TELEVISION OUTLET
TYP	TYPICAL
U	
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UL	UNDER WRITERS LABORATORIES
UTP	UNSHIELDED TWITED PAIR
UTIL	UTILITY
UV	UNIT VENTILATOR; ULTRAVIOLET
V	
V	VOLT
VA	VOLT AMPERE
VAM	VOLTAMMETER
VAR	VARIATION; VARIES; VOLT AMPERE REACTIVE
VD	VOLTAGE DROP; VOLUME DAMPER
VERT	VERTICAL
VF	VARIABLE FREQUENCY
VFD	VARIABLE FREQUENCY DRIVE
VID	VIDEO
VIF	VERIFY IN FIELD
VOLT	VOLTAGE
VR	VOLTAGE REGULATOR; VAPOR RETARDED
VRFY	VERIFY
VRLY	VOLTAGE RELAY
VS	VOLTMETER SWITCH; VENT STACK
W	
W	WIRE; WATT; WASTE; WEST; WIDE
W/	WITH
W/O	WITHOUT
WHM	WATTHOUR METER
WP	WEATHERPROOF; WATER PUMP; WATER HEATER
WR	WEATHER RESISTANT; WATER REPELLENT
WW	WIREWAY; WARM WHITE; WASTE WATER
X	
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. GROUP AND TRAIN ALL TEL/DATA CABLE. SUPPORT FROM STRUCTURE.
10. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
11. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
12. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

ELECTRICAL LEGEND

WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

LIGHTING LEGEND

$	SINGLE POLE SWITCH

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA
GENERAL SERVICES
DIVISION

PROJECT STATUS:

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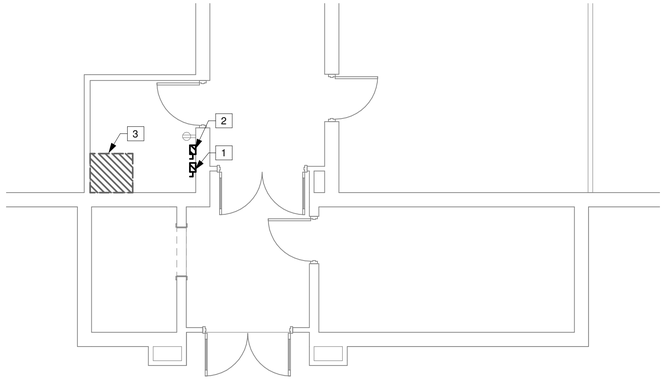
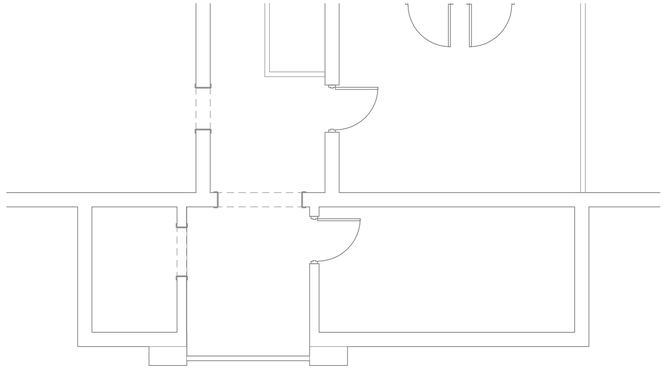
SHEET NAME:

BUILDING #15 -
ELECTRICAL
ABBREVIATIONS

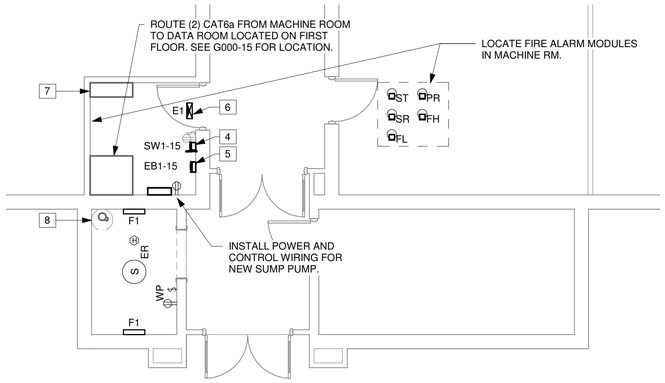
E000-15



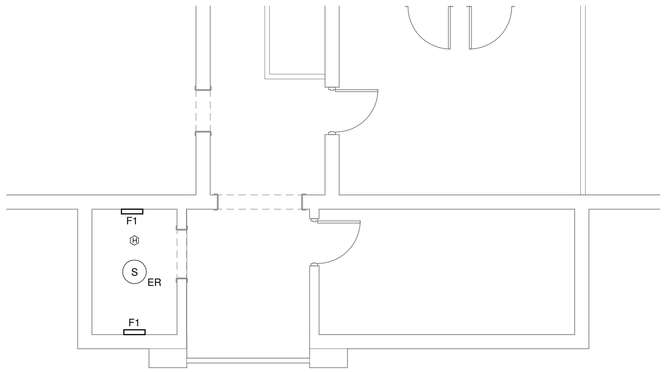
1 FIRST FLOOR ELECTRICAL DEMOLITION PLAN
3/16" = 1'-0"



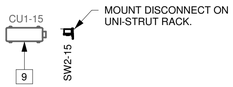
2 SECOND FLOOR ELECTRICAL DEMOLITION PLAN
3/16" = 1'-0"

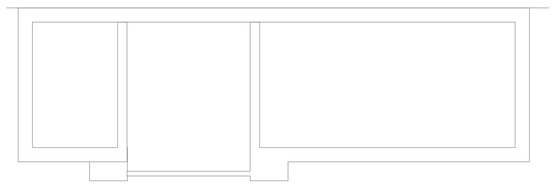


3 FIRST FLOOR ELECTRICAL PLAN
3/16" = 1'-0"



4 SECOND FLOOR ELECTRICAL PLAN
3/16" = 1'-0"





5 ROOF ELECTRICAL PLAN
3/16" = 1'-0"

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

FIRE ALARM LEGEND

- M — MANUAL PULL STATION
- S — SMOKE DETECTOR
- S ER — SMOKE DETECTOR - ELEVATOR RECALL
- H — HEAT DETECTOR
- F — HORN / STROBE
- S — STROBE LIGHT
- ST — ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
- PR — ADDRESSABLE MODULE - PRIMARY RECALL
- SR — ADDRESSABLE MODULE - SECONDARY RECALL
- FH — ADDRESSABLE MODULE - FIREMAN'S HAT
- FH — ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. GROUP AND TRAIN ALL TEL/DATA CABLE. SUPPORT FROM STRUCTURE.
10. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
11. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
12. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

ELECTRICAL LEGEND

- WP — 120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

LIGHTING LEGEND

- $ — SINGLE POLE SWITCH

SHEET NOTES

1. DEMO ELEVATOR POWER DISCONNECT. LEAVE WIRE TO REMAIN FOR NEW ENCLOSED BREAKER.
2. DEMO 120V CAR DISCONNECT. DEMO CONDUIT & WIRE FROM CAR TO DISCONNECT. LEAVE LINE SIDE WIRING TO DISCONNECT FOR NEW DISCONNECT.
3. DEMO POWER TO ELEVATOR CONTROLLER.
4. TERMINATE EXISTING LINE SIDE WIRING TO NEW ELEVATOR CAR DISCONNECT. INSTALL NEW CONDUIT & WIRE TO CAR.
5. TERMINATE EXISTING LINE SIDE WIRING TO NEW ELEVATOR ENCLOSED BREAKER. INSTALL NEW CONDUIT & WIRE TO CONTROLLER.
6. TIE TO NEAREST LIGHT CIRCUIT AHEAD OF SWITCH.
7. POWER CONTROLLER FROM PANEL LOCATED ON SECOND FLOOR ELECTRICAL ROOM. SEE SHEET G000-15 FOR ROOM LOCATION.
8. POWER SUMP PUMP FROM PANEL LOCATED ON SECOND FLOOR ELECTRICAL ROOM. SEE SHEET G000-15 FOR ROOM LOCATION.
9. POWER CONDENSER UNIT FROM PANEL LOCATED ON SECOND FLOOR ELECTRICAL ROOM. SEE SHEET G000-15 FOR ROOM LOCATION.

LIGHT FIXTURE SCHEDULE

TAG	MFR	MODEL	LUMENS	COLOR TEMP.	VOLTS	WATTS	COMMENTS
F1	LUMINAIRE LED	ESF18-NODIM-50W-40K-MVOLT-CLP-GRY-EMB310-WL-NOOCC	5,280 lm	4,000 K	120-277	50 W	WALL MOUNTED VANDAL RESISTANT LED FIXTURE; CLEAR; PRISMATIC LENS; GRAY HOUSING; WET LOCATION; EMERGENCY BACKUP (1,200 LUMENS)

DISCONNECT SWITCH SCHEDULE

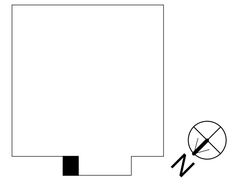
TAG	SERVES	POLES	VOLTAGE	DEVICE RATING	FUSE RATING	ENCLOSURE	DESCRIPTION
SW1-15	ELEVATOR CAR	2	240 V	30 A	20 A	TYPE1	FUSED DISCONNECT SWITCH
SW2-15	CU1-15	2	240 V	30 A	20 A	TYPE3R	FUSED DISCONNECT SWITCH

ENCLOSED BREAKER SCHEDULE

TAG	SERVES	POLES	VOLTAGE	RATING	DESCRIPTION
EB1-15	ELEVATOR POWER	3	240 V	100 A	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY

EXIT & EMERGENCY LIGHTING SCHEDULE

TAG	MFR	MODEL	DESCRIPTION
E1	LITHONIA	LHQMLEDRHOSD	COMBINATION EXIT SIGN W/ EMERGENCY FIXTURE. WHITE THERMOPLASTIC BODY W/ RED LETTERING.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:
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GENERAL SERVICES
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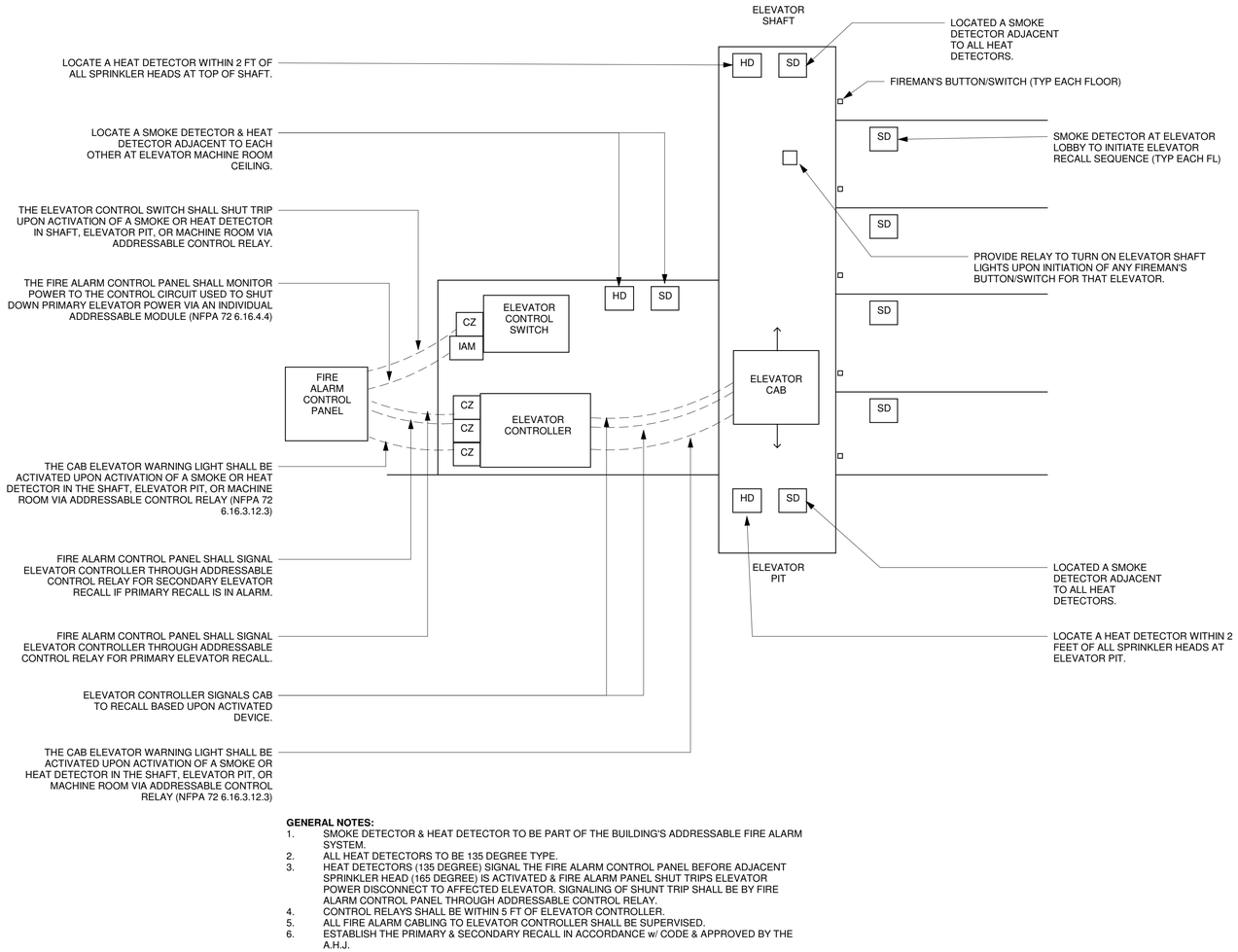
BUILDING #15 -
DEMOLITION & NEW
ELECTRICAL PLANS

E101-15

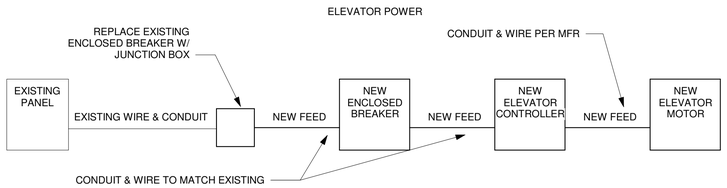


GENERAL NOTES:

1. SMOKE DETECTOR & HEAT DETECTOR TO BE PART OF THE BUILDING'S ADDRESSABLE FIRE ALARM SYSTEM.
2. ALL HEAT DETECTORS TO BE 135 DEGREE TYPE.
3. HEAT DETECTORS (135 DEGREE) SIGNAL THE FIRE ALARM CONTROL PANEL BEFORE ADJACENT SPRINKLER HEAD (165 DEGREE) IS ACTIVATED & FIRE ALARM PANEL SHUT TRIPS ELEVATOR POWER DISCONNECT TO AFFECTED ELEVATOR. SIGNALING OF SHUNT TRIP SHALL BE BY FIRE ALARM CONTROL PANEL THROUGH ADDRESSABLE CONTROL RELAY.
4. CONTROL RELAYS SHALL BE WITHIN 5 FT OF ELEVATOR CONTROLLER.
5. ALL FIRE ALARM CABLING TO ELEVATOR CONTROLLER SHALL BE SUPERVISED.
6. ESTABLISH THE PRIMARY & SECONDARY RECALL IN ACCORDANCE w/ CODE & APPROVED BY THE A.H.J.

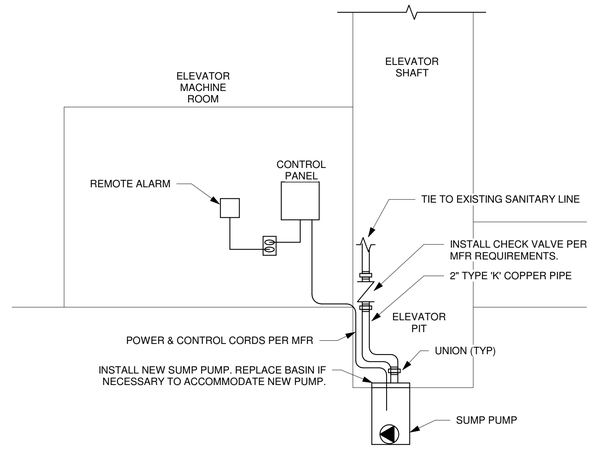
1 ELEVATOR SIGNAL CONTROLS DETAIL

DRAWING NOT SCALABLE



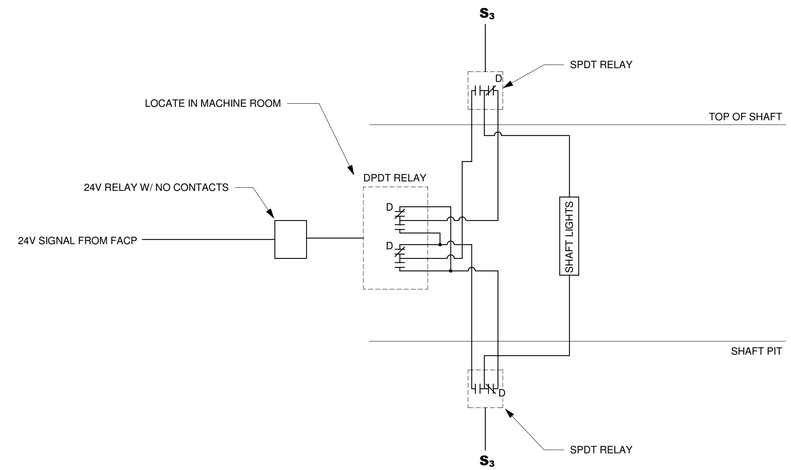
2 ELEVATOR POWER ONE-LINE

DRAWING NOT SCALABLE



3 SUMP PUMP ELECTRICAL DETAIL

DRAWING NOT SCALABLE



4 SHAFT LIGHTING FIRE ALARM INTERFACE DETAIL

DRAWING NOT SCALABLE

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BUILDING #15 - ELECTRICAL DETAILS

E501-15

PLUMBING ABBREVIATIONS

A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABLITIES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
B	
BB	BASEBOARD
BC	BALANCING COCK
BD	BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BLR	BOILER
BLW	BELOW
BO	BLOW OFF
BTM	BOTTOM
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CDL	CONDENSATE DRAIN LINE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHKV	CHECK VALVE
CHWR	CHILLED & HOT WATER RETURN
CHWS	CHILLED & HOT WATER SUPPLY
CHWS&R	CHILLED & HOT WATER SUPPLY AND RETURN
CIRC	CIRCULATING
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
CLG	CEILING
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
C/O	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWFT	CONDENSER WATER FROM TOWER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SUPPLY AND RETURN
CWTT	CONDENSER WATER TO TOWER
D	
D	DEEP
Db	DRY BULB TEMPERATURE(ºF)
DCO	DOUBLE CLEAN OUT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM
DISCH	DISCHARGE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPT	DEW POINT TEMPERATURE(ºF)
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
E	
EA	EACH
EC	ELECTRICAL CONTRACTOR
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER(BOTTOMS FLAT)
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATUR(ºF)

F	
ºF	FAHRENHEIT
FA	FREE AREA
FB	FREE BLOW
F&T	FLOAT AND THERMOSTATIC TRAP
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FDN	FOUNDATION
FF	FOULING FACTOR
FIN	FINISHED
FLA	FULL LOAD AMPS
FLG	FLANGE
FLR	FLOOR
FNL	FUNNEL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOS&R	FUEL OIL SUPPLY AND RETURN
FOV	FUEL OIL VENT
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE/FEET
FTG	FITTING
FURN	FURNISH
FV	FACE VELOCITY
FW	FEED WATER
G	
G	GAS
GALV	GALVANIZED
GA	GAUGE, GAGE
GC	GENERAL CONTRACTOR
GCWR	GLYCOL CHILLED WATER RETURN
GCWS	GLYCOL CHILLED WATER SUPPLY
GHWR	GLYCOL HOT WATER RETURN
GHWS	GLYCOL HOT WATER SUPPLY
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAV	GRAVITY
GRV	GRAVITY ROOF VENTILATOR
GV	GATE VALVE
H	
H	HEIGHT
HB	HOSE BIBB
HC	HEATING CONTRACTOR; HANICAPPED
HD	HEAD/HUB DRAIN
HG	MERCURY
HGR	HANGER
HP	HORSEPOWER/HEAT PUMP
HORIZ	HORIZONTAL
HPD	HIGH PRESSURE DRIP
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HTR	HEATER
HUH	HORIZONTAL UNIT HEATER
HV	HIGH VELOCITY
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HWBG	HOT WATER BELOW GRADE
HWOH	HOT WATER OVER HEAD
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IN-WG	INCHES-WATER GAGE
INSUL	INSULATION
IPS	IRON PIPE SIZE
IVS	ISOLATION VALVE STATION
IW	INDIRECT WASTE
J	
JT	JOINT
K	
KS	KITCHEN SINK
L	
L	LENGTH
LAV	LAVATORY
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LOW PRESSURE
LPD	LOW PRESSURE DRIP
LPR	LOW PRESSURE RETURN
LPG	LOW PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LV	LOW VELOCITY
LVG	LEAVING
LWCO	LOW WATER CUTOFF
LWT	LEAVING WATER TEMPERATURE(ºF)

M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MPD	MEDIUM PRESSURE DRIP
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
MS	MINI-SPLIT SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MWT	MEAN WATER TEMPERATURE(ºF)
N	
N	NORTH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
ODS	OXYGEN DEPRIVATION SENSOR
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OFD	OVER FLOW DRAIN
OH	OVERHEAD
OPER	OPERATED
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OUT	OUTLET
OVC	OVERCURRENT
OVF	OVERFLOW
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP/PUMP
PE	PNEUMATIC - ELECTRIC
PG	PRESSURE DROP/PUMP DISCHARGE
PH	PHASE
PLBG	PLUMBING
PNL	PANEL
PR	PANEL RADIATOR
PRESS	PRESSURE
PRV	POWER ROOF VENTILATOR/PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	PRESSURE/TEMPERATURE TAP
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
RA	RELIEF/RETURN AIR
RAD	RADIATOR
RAF	RETURN AIR FIXTURES
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED/RECEIVED
REFRIG	REFRIGERANT
REG	REGISTER
REINF	REINFORCED
REQD	REQUIRED
RET	RETURN
REV	REVISION
RF	RETURN/RELIEF FAN
RH	REHEAT COIL
RHG	REFRIGERANT HOT
RL	REFRIGERANT LIQUID
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
RWC	RAIN WATER CONDUCTOR

S	
SA	SUPPLY AIR
SCH	SCHEDULE
SDPR	SMOKE DAMPER
SENS	SENSIBLE
SEP	SEPARATOR
SF	SUPPLY FAN
SHT	SHEET
SK	SINK
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SPGR	SPECIFIC GRAVITY
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL UNIT
STAT	STATIC
STD	STANDARD
STL	STEEL
STR	STRAINER
SUP	SUPPLY
SV	SAFETY VALVE
SW	SWITCH
T	
TA	THROW AWAY
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TH	THERMOMETER
THK	THICK
TK	TANK
TMV	THRTMOSTATIC MIXING VALVE
TOT	TOTAL
TP	TRAP PRIMER/TRAP PRIMER SUPPLY
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
UC	UNDERCUT
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
V	
V	VOLTAGE/VALVE/VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VFS	VENTURI FLOW STATION
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THROUGH ROOF
W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WA	WATER HAMMER ARRESTER
Wb	WET BULB TEMPERATURE(ºF)
WC	WATER COLUMN/WATER CLOSET
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HEATER
WL	WATER LEVEL
WP	WEATHERPROOF
WT	WEIGHT
Y	
YCO	YARD CLEANOUT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PLUMBING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEMS AS INDICATED ON THE DRAWING, AS SPECIFIED, AND REQUIRED BY CODE.
2. PROVIDE SHUTOFF VALVES IN ALL DOMESTIC WATER PIPING SYSTEMS AT ALL SERVICE POINTS AND AT BRANCHES IN WHICH PIPING SERVES TWO OR MORE FIXTURES.
3. UNLESS OTHERWISE NOTED, ALL DOMESTIC COLD AND HOT WATER PIPING SHALL BE A MIN. OF 1/2" SIZE.
4. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB w/ SPACE FOR INSULATION IF REQUIRED. PIPING IS TO BE "TOP DOWN".
5. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
6. WHERE DOMESTIC COLD AND HOT WATER PIPING DROPS INTO A PIPE CHASE. THE SIZE SHOWN FOR THE PIPE DROPS SHALL BE USED TO THE LAST FIXTURE.
7. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.
8. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAINS VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
9. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (GREATER THAN 100 FEET) TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
10. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
11. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
12. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTIONS, NEAR THE BASE OF STACKS, EVERY 50'-0" IN HORIZONTAL RUN AND ELSEWHERE AS INDICATED.
13. ALL CLEANOUTS SHALL BE FULL SIZE OF PIPE FOR PIPE SIZES 4 INCHES AND SMALLER AND SHALL BE 4 INCHES FOR PIPE SIZES LARGER THAN 4 INCHES.
14. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOP (MEMORY STOPS).
15. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
16. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
17. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AS CLOSE TO THE EQUIPMENT AS POSSIBLE OR AS INDICATED ON THE DRAWINGS.
18. DOMESTIC WATER PIPING IS TO BE TYPE "K" COPPER w/ SOLDERED FITTINGS EXCEPT AS INDICATED.
19. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER CURRENT I.P.C. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
20. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w/ GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING AND MAINTAIN PRESSURE TESTING DURING CONCRETE POURS.
21. PRESSURE TEST ALL DOMESTIC WATER PIPING w/ WATER. AIR TESTING IS NOT PERMITTED.
22. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
23. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.
24. EXTEND ALL VENTS THROUGH ROOF.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA
GENERAL SERVICES
DIVISION

PROJECT STATUS:

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DOCUMENTS

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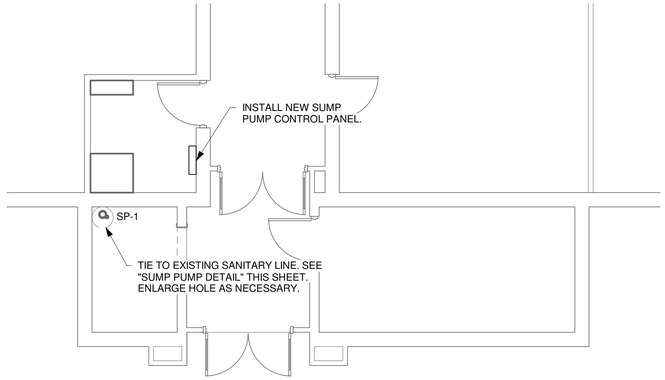
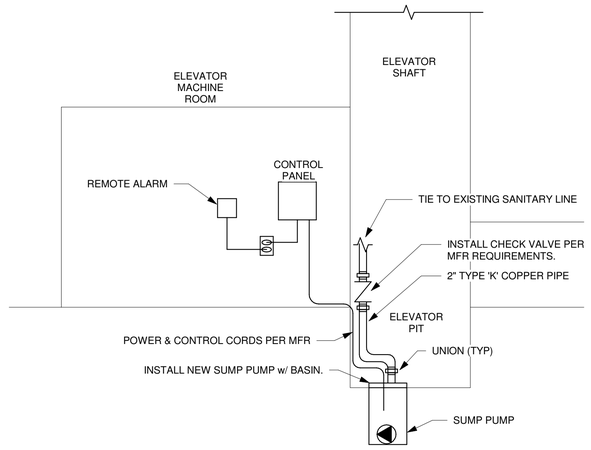
BUILDING #15 -
PLUMBING
ABBREVIATIONS

P000-15



1 FIRST FLOOR PLUMBING PLAN

3/16" = 1'-0"



2 SUMP PUMP DETAIL

DRAWING NOT SCALABLE

SUMP PUMP SCHEDULE

MARK	SERVES	MFR	MODEL	FLOW RATE	HEAD	HP	PHASE	VOLTS	MCA	MOCP	COMMENTS
SP-1	ELEVATOR 1	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.

PLUMBING NOTES

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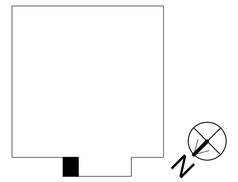

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture

Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

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WEST VIRGINIA GENERAL SERVICES DIVISION

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CHECKED BY:	BCM

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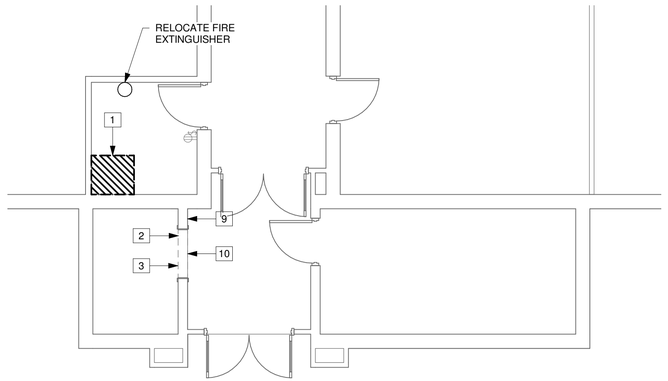
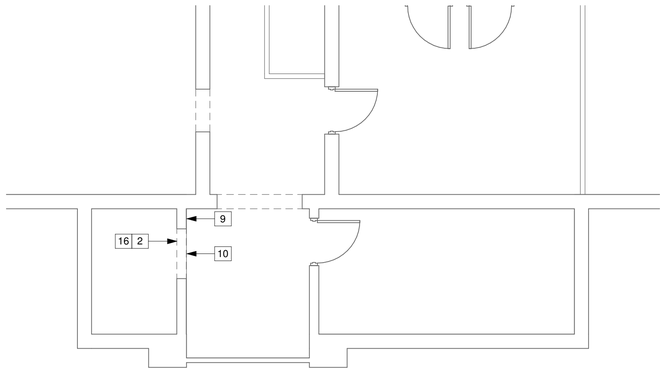
BUILDING #15 - NEW PLUMBING PLAN

P101-15



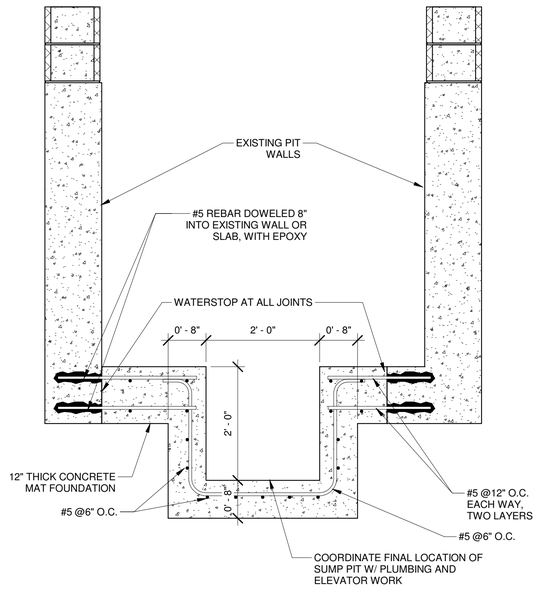
1 FIRST FLOOR EQUIPMENT DEMOLITION PLAN
3/16" = 1'-0"



2 SECOND FLOOR EQUIPMENT DEMOLITION PLAN
3/16" = 1'-0"

3 FIRST FLOOR EQUIPMENT PLAN
3/16" = 1'-0"

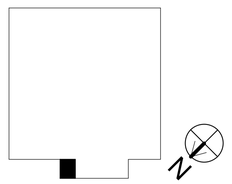
4 SECOND FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



5 ELEVATOR PIT DETAIL
DRAWING NOT SCALABLE

SHEET NOTES

1. DEMO HYDRAULIC ELEVATOR MACHINE PUMP, ETC. FOR COMPLETE REPLACEMENT.
2. DEMO DOOR OPERATOR SYSTEM.
3. DEMO EXISTING PIT LADDER.
4. (NOT USED)
5. NEW DOOR OPERATOR SYSTEM.
6. NEW PIT LADDER w/ STOP SWITCH.
7. DOOR JAMBS ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, IF NEEDED, COLOR BY ARCHITECT.
8. ELEVATOR CAR PANEL TO BE RETROFITTED OR REPLACED TO ACCOMMODATE THE ADA VIDEO PHONE.
9. DEMO HALL CALL
10. DEMO FLAGS AND FLOOR INDICATOR.
11. PROVIDE NEW HALL CALL TO FIT ON EXISTING ROUGH-INS WITHOUT ADAPTERS.
12. PROVIDE NEW FLAGS AND FLOOR INDICATOR TO FIT ON EXISTING ROUGH-INS WITHOUT ADAPTERS.
13. PROVIDE NEW SEPARATE FIRE MAN'S HAT.
14. INSTALL NEW HYDRAULIC ELEVATOR MACHINE PUMP.
15. INSTALL NEW ELEVATOR CONTROLLER.
16. PAN OFF TOE CATCH WITHIN HOISTWAY AS NECESSARY TO MEET ANSI STANDARDS.
17. APPLY XYPEX CONCENTRATE (OR SIMILAR) BASE COAT AND XYPEX MODIFIED (OR SIMILAR) TOP COAT ON VERTICAL AND HORIZONTAL SURFACES IN EXISTING ELEVATOR PITS BELOW THE BOTTOM FLOOR LEVEL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
18. INSTALL RETROFIT WATERSTOPS AT PATCHED CONCRETE WITHIN ELEVATOR PITS.



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WV OFFICE:
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MORGANTOWN, WV 26508
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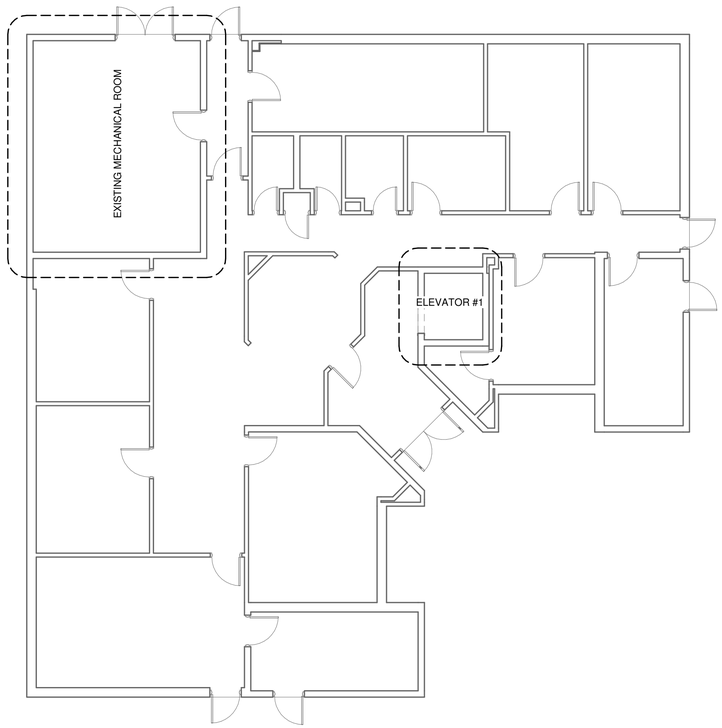
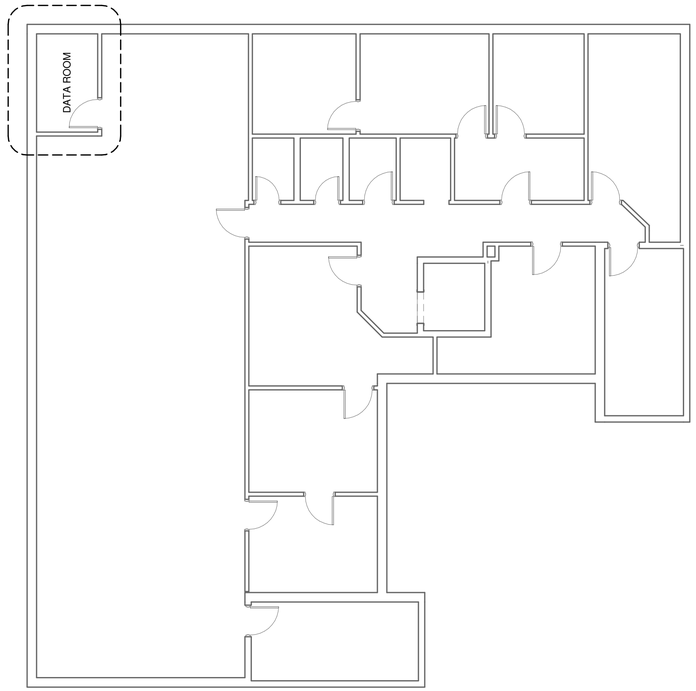
BUILDING #15 - DEMOLITION & NEW ELEVATOR EQUIPMENT PLANS

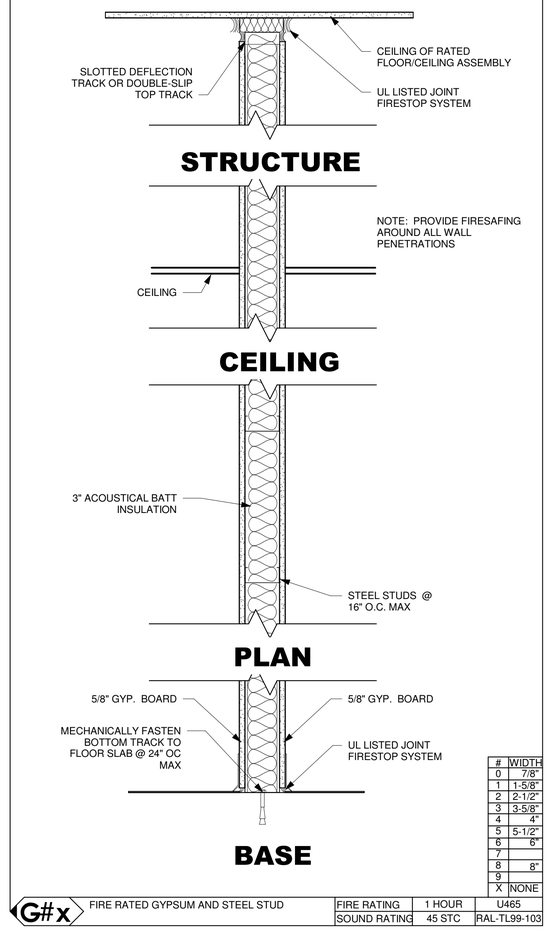
Q101-15



1 REFERENCE MASTER FLOOR PLAN - FIRST FLOOR
1/8" = 1'-0"

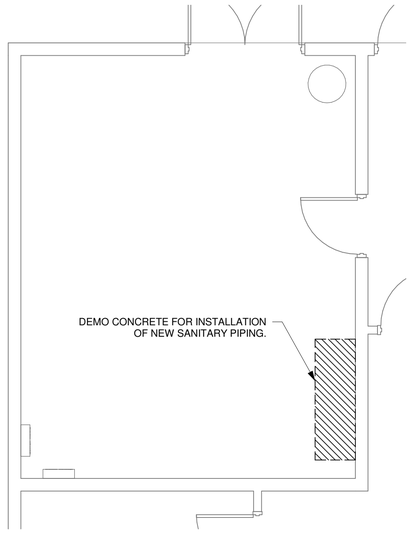


2 REFERENCE MASTER FLOOR PLAN - SECOND FLOOR
1/8" = 1'-0"

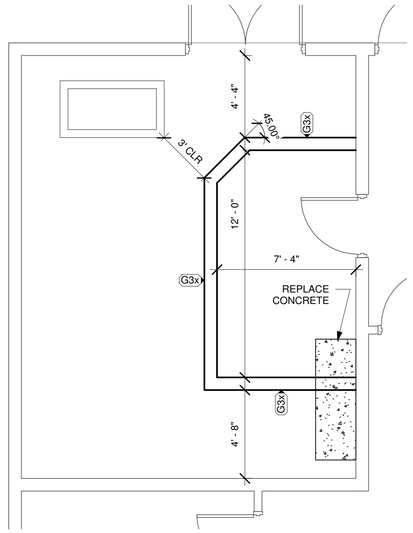


#	WIDTH
0	7/8"
1	1-5/8"
2	2-1/2"
3	3-5/8"
4	4"
5	5-1/2"
6	6"
7	
8	8"
9	
X	NONE

G#x	FIRE RATED GYPSUM AND STEEL STUD	FIRE RATING	1 HOUR	U465
		SOUND RATING	45 STC	RAL-TL99-103



3 FIRST FLOOR GEN TRADES DEMO PLAN
1/4" = 1'-0"



4 FIRST FLOOR GEN TRADE PLAN
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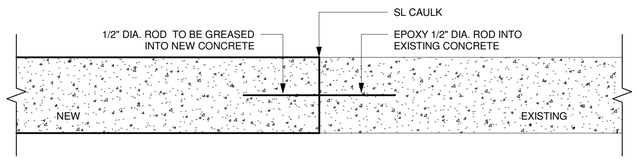
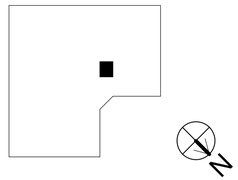


5 FLOOR SLAB CONNECTION DETAIL
DRAWING NOT SCALABLE



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SEAL:
STATE OF WEST VIRGINIA
THOMAS F. PRUTS
4049
REGISTERED ARCHITECT

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

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BUILDING #17 - GENERAL BUILDING LAYOUT

G000-17

MECHANICAL ABBREVIATIONS

SYMBOLS	
#	NUMBER
&	AND
°	DEGREES
ºF	DEGREES FAHRENHEIT
A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
AUX	AUXILIARY
AVG	AVERAGE
B	
BFV	BUTTERFLY VALVE
BH	BASEBOARD HEATER
BHP	BRAKE HORESPOWER
BLR	BOILER
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CHKV	CHECK VALVE
CIRC	CIRCULATING
CI	CAST IRON
CKT	CIRCUIT
CMU	CONCRETE MASONARY UNIT
C/O	CLEAN OUT
CON	CONDENSATE
CONT	CONTINUATION
CT	COOLING TOWER
CU	CONDENSING UNIT
D	
DIA	DIAMETER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE(ºF)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE(ºF)
F	
ºF	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	
GAS	NATURAL GAS
GALV	GALVANIZED
GA	GAUGE
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	
HCWL	HYDRONIC CHILLED WATER LOOP
HCWR	HYDRONIC CHILLED WATER RETURN
HCWS	HYDRONIC CHILLED WATER SUPPLY
HHWL	HYDRONIC HOT WATER LOOP
HHWR	HYDRONIC HOT WATER RETURN
HHWS	HYDRONIC HOT WATER SUPPLY
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
J	
JB	JUNCTION BOX
K	
KW	KILOWATT
KWH	KILOWATT HOUR
L	
LAT	LEAVING AIR TEMPERATURE(ºF)
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LIQUID PROPANE
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MS	MINI-SPLIT SYSTEM
N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
Q	
QTY	QUANTITY
R	
RA	RETURN AIR
RAD	RADIATOR
RCP	RADIANT CEILING PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SMOKE DAMPER
SENS	SENSIBLE
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T	
T	THERMOSTATE
TA	TRANSFER AIR
TCV	TEMPERATURE CONTROL VALVE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TSTAT	THERMOSTAT
TV	TURNING VANES
TYP	TYPICAL
U	
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	
VOLTS	VOLTAGE
VA	VOLT AMPERES
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VOLTS	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VVT	VARIABLE VOLUME AND TEMPERATURE
W	
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WT	WEIGHT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PIPING NOTES

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MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

BRIAN C. MILLER
REGISTERED
15184
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

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WEST VIRGINIA GENERAL SERVICES DIVISION

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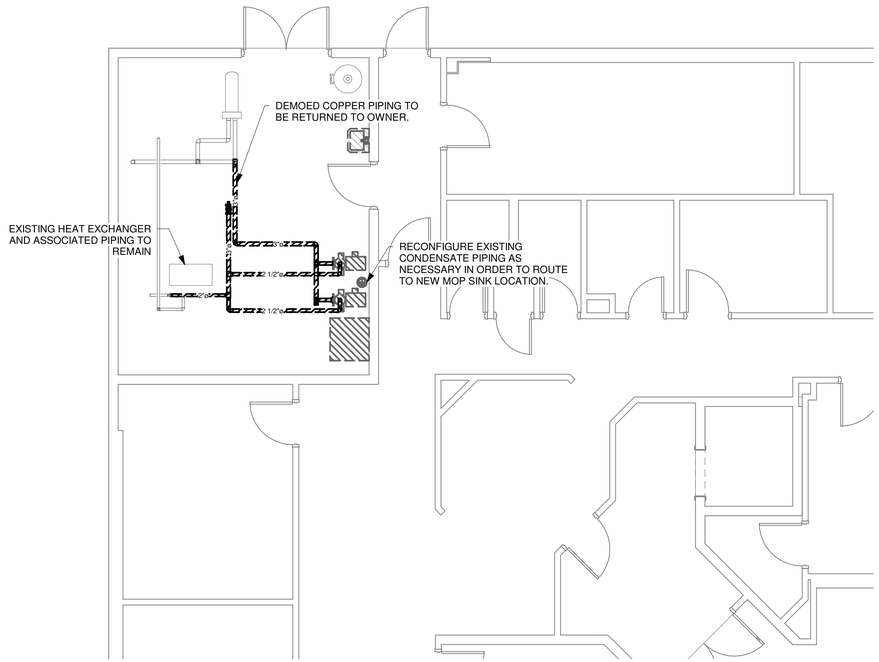
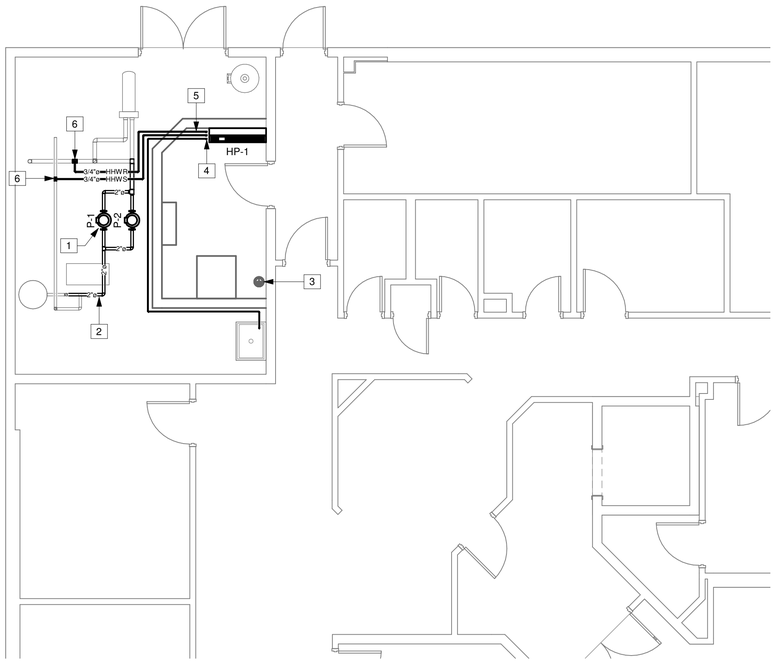
BUILDING #17 - MECHANICAL ABBREVIATIONS

M000-17



1 FIRST FLOOR MECHANICAL DEMOLITION PLAN

3/16" = 1'-0"

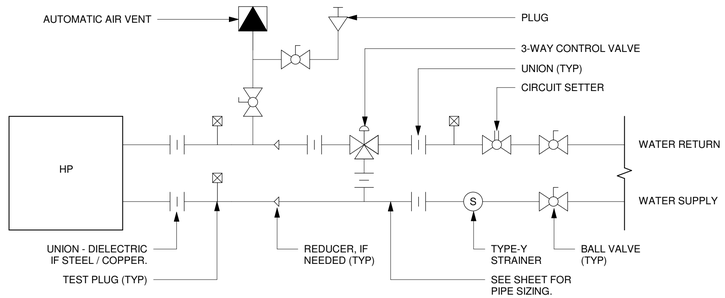


2 FIRST FLOOR MECHANICAL PLAN

3/16" = 1'-0"

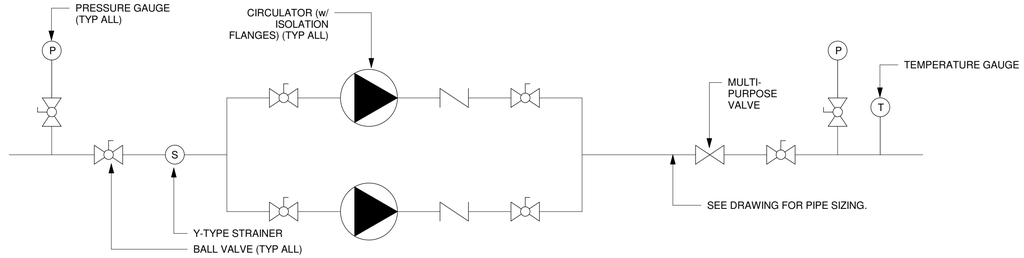
PUMP SCHEDULE

MARK	GENERAL INFORMATION				PUMP INFORMATION			ELECTRICAL INFORMATION	
	MANUFACTURER	MODEL	SYSTEM	FLUID TYPE	FLOW RATE	HEAD	HORSEPOWER	VOLTAGE	PHASE
P-1	TACO	KV1509	HOT WATER	WATER	92 GPM	60 ft	5 hp	120 V	1
P-2	TACO	KV1509	HOT WATER	WATER	92 GPM	60 ft	5 hp	120 V	1



3 2-PIPE COIL CONNECTION DETAIL

DRAWING NOT SCALABLE



4 DUAL CIRCULATING PUMP DETAIL

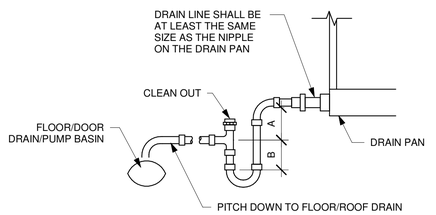
DRAWING NOT SCALABLE

WATER SOURCE HEAT PUMP SCHEDULE

MARK	MFR.	MODEL	AIR FLOW	FLUID TYPE	FLUID FLOW	COOLING INFORMATION								HEATING INFORMATION					ELECTRICAL INFORMATION				NOTES
						COOLING LOADS		ENTERING		LEAVING		WATER TEMPERATURE		HEATING LOAD	AIR TEMPERATURE		WATER TEMPERATURE		VOLT	PHASE	MCA	MOCP	
						SENS	TOTAL	DB	WB	DB	WB	ENTER	LEAVE		ENTER	LEAVE	ENTER	LEAVE					
HP-1	CARRIER	50PEC18	520 CFM	WATER	4.5 GPM	12,700 Btu/h	16,500 Btu/h	80.0 °F	67.0 °F	57.5 °F	56.7 °F	85.0 °F	94.2 °F	22,900 Btu/h	68.0 °F	108.8 °F	70.0 °F	62.3 °F	208 V	1	10.0 A	15 A	PROVIDE w/ DISCONNECT; FLOOR MOUNTED UNIT

SHEET NOTES

1. NEW PUMPS IN "VOID SPACE" OVERHEAD APPROXIMATELY 9'-0" A.F.F. NEAR EXISTING HEAT EXCHANGER. PIPING APPROXIMATE 8'-0" A.F.F.
2. NEW PIPING TO BE TYPE "K" COPPER.
3. RECONFIGURE EXISTING CONDENSATE PIPING TO FLOOR DRAIN AS NECESSARY IN ORDER TO ROUTE TO NEW MOP SINK LOCATION.
4. PROVIDE LITTLE GIANT - VCL-45ULS (OR APPROVED EQUAL) TO PUMP CONDENSATE TO NEW MOP SINK. NEW, PUMPED CONDENSATE PIPING TO BE 3/8" SOFT COPPER TUBING, NO VINYL TUBING. ROUTE PIPING UP TO DECK.
5. UP TO DECK.
6. DOWN TO TAP.



UNIT TYPE	A	B
DRAW THROUGH	P+1"	P
BLOW THROUGH	2" MIN.	2P

P = STATIC PRESSURE OF UNITS IN INCHES OF H20

5 CONDENSATE DRAIN DETAIL

DRAWING NOT SCALABLE

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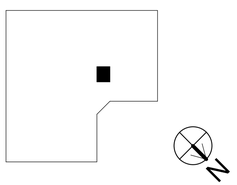

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
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CARMICHAELS, PA 15320
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BUILDING #17 - DEMOLITION & NEW MECHANICAL PLANS

M101-17

ELECTRICAL ABBREVIATIONS

1P	SINGLE POLE
1PH	SINGLE-PHASE
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3WAY	THREE-WAY
4/C	FOUR-WIRE
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4WAY	FOUR-WAY
4W	FOUR-WIRE
ø	PHASE
A	
A	AMPERE
AC	ALTERNATING CURRENT; ARMORED CABLE
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
A/E	ARCHITECT/ENGINEER
AFC	ABOVE FINISHED COUNTER
AFCI	ARC FAULT CIRCUIT INTERUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANN	ANNUNCIATOR
APPD	APPROVED
APPROX	APPROXIMATELY; APPROXIMATE
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING; AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
ATTN	ATTENTION
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AVG	AVERAGE
AWG	AMERICAN WRE GAUGE
B	
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BFF	BELOW FINISHED FLOOR
BG	BELOW GRADE
BKBD	BACKBOARD
BLDG	BUILDING
BLT	BUILT
BLW	BELOW
BOT	BOTTOM
BPS	BOLTED PRESSURE SWITCH
BRKR	BREAKER
BSMT	BASEMENT
BTWN	BETWEEN
BX	INTERLOCKED ARMORED CABLE
BYP	BYPASS
C	
C	CELSIUS
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION SYSTEM
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CD	CANDELA; CONSTRUCTION DOCUMENTS;
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CIR	CIRCLE
CKT	CIRCUIT
C	CENTERLINE
CL	CURRENT LIMITING; CENTER LINE; CLASS; CLOSE
CLG	CEILING
CLR	CLEAR
CND	CONDUIT
COAX	COAXIAL
COL	COLUMN
COMB	COMBINATION; COMBINED
COMM	COMMUNICATION
COMPR	COMPRESSOR
CONC	CONCRETE
CONN	CONNECT
CORR	CORRIDOR; CORRECT
CP	CONTROL PANEL
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTR	CENTER
CTRL	CONTROL
CU	COPPER; COEFFICIENT OF UTILIZATION; CUBIC
CU FT	CUBIC FEET
CUR	CURRENT
D	
D	DEPTH
DB	DIRECT BURIAL / DECIBEL
DBL	DOUBLE
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DEL	DELETE; DELIVER
DEMO	DEMOLITION; DEMONSTRATION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM; DIAGONAL
DIFF	DIFFERENCE
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE; DISTRICT
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION; DIVIDE
DN	DOWN
DOC	DOCUMENT
DPDT	DOUBLE POLE; DOUBLE THROW
DPST	DOUBLE POLE; SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING

E	
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ELR	END OF LINE RESISTOR
EM	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENGR	ENGINEER
ENGY	ENERGY
ENT	ELECTRICAL NONMETALLIC TUBING
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EST	ESTIMATE
ESTB	ESTABLISH
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION; EXPOSED; EXPAND
EXT	EXTERIOR; EXTERNAL
EXTN	EXTENSION
F	
F	FAHRENHEIT; FEMALE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FOOT-CANDLE
FCU	FAN COIL UNIT
FDR	FEEDER
FIN	FINISH
FIN GR	FINISH GRADE
FIXT	FIXTURE
FL MT	FLUSH MOUNT
FLEX	FLEXIBLE
FLG	FLOORING
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FREQUENCY MODULATION
FP	FIREPROOF
FR	FIRE RESISTANT
FREQ	FREQUENCY
FS	FUSIBLE SWITCH; FLOW SWITCH
FSC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET; FIRE TREATED; FOOT
FU	FUSE
FU SW	FUSED SWITCH
FURN	FURNISH; FURNACE; FURNITURE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL; GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GOVT	GOVERNMENT
GRN	GROUND
GYP	GYPSUM
H	
HDW	HARDWARE
HF	HIGH FREQUENCY
HID	HIGH INTENSITY DISCHARGE
HO	HOLD OPEN
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER; HEAT PUMP; HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ; FREQUENCY IN CYCLES PER SECOND
I	
ID	INSIDE DIAMTER; INSIDE DIMENSION; IDENTIFICATION
ILLUM	ILLUMINATION
IMC	INTERMEDIATE METAL CONDUIT
INFO	INFORMATION
INSUL	INSULATION
INTERCOM	INTERCOMMUNICATION
INTL	INTERNATIONAL
IR	INFRARED; INSIDE RADIUS
IT	INFORMATION TECHNOLOGY
J	
JB	JUNCTION BOX
K	
KCMIL	THOUSAND CIRCULAR MILS
KHz	KILOHERTZ
KIT	KITCHEN
KO	KNOCKOUT
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kVAh	KILOVOLT AMPERE PER HOUR
kVAR	KILOVAR; KILOVOLT AMPERE REACTIVE
kW	KILOWAT
kWh	KILOWATT HOURS
L	
L	LITER; ANGLE
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LM	LUMEN
LOC	LOCATION
LP	LIGHT POLE; LOW PRESSURE
LPW	LUMENS PER WATT
LT	LIGHT
LT SW	LIGHT SWITCH
LTD	LIMITED
LTG	LIGHTING
LV	LOW VOLTAGE

M	
M	METER
mA	MILLIAMPERE
MACH	MACHINE
MAG	MAGNET
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMIM
MC	MECHANICAL CONTRACTOR; METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MED	MEDICAL; MEDIUM
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MH	MANHOLE; METAL HALIDE
MHZ	MEGAHERTZ
MI	MINERAL INSULATED
MIC	MICROPHONE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOA	MULTIOUTLET ASSEMBLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MODIFY; MODULE
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MEETING; MOUNTING
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MULT	MULTIPLE
mV	MILLIVOLT
MVA	MEGAVOLT-AMPERE
MW	MEGAWATT; MICROWAVE
mW	MILLIWATT
MWH	MEGAWATT HOUR
N	
N	NORTH
NC	NORMALLY CLOSED
NE	NORMAL EMERGENCY
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN; NUMBER
NORM	NORMAL
NTS	NOT TO SCALE
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OH	OVERHEAD
OL	OVERLOAD ELEMENT
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OVC	OVERCURRENT
P	
P	POLE (S); PILOT
PA	POWER AMPLIFIER; PUBLIC ADDRESS
PART	PARTIAL
PB	PULL BOX; PANEL BOARD; PANIC BAR; PUSH-BUTTON
PC	PLUMBING CONTRACTOR; PIECE
PE	PHOTOELECTRIC, PNEUMATIC ELECTRIC
PEN	PENETRATE
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PLBG	PLUMBING
PNL	PANEL
POS	POSITION; POSITIVE
PP	POWER POLE
PR	PAIR
PRELIM	PRELIMINARY
PREP	PREPARATION
PRESS SW	PRESSURE SWITCH
PREV	PREVIOUS
PRI	PRIMARY
PROJ	PROJECT
PS	PULL STATION
PT	POTENTIAL TRANSFORMER
PVC	POLYVINAL CHLORIDE (PLASTIC)
PWR	POWER
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QTY	QUANTITY
QUAL	QUALITY

R	
R	RELAY; RADIUS
R/W	RIGHT OF WAY
RC	REMOTE CONTROL
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RCPT	RECEPTACLE
REF	REFRIGERATOR; REFERENCE
REINF	REINFORCED
REPL	REPLACE
REQD	REQUIRED
REV	REVISION; REVOLUTIONS
RFI	REQUEST FOR INFORMATION
RFP	REQUEST FOR PROPOSAL
RH	RIGHT HAND
RHC	REHEAT COIL
ROW	RIGHT OF WAY
RS	RAPID START
RTG	RATING
RTU	ROOF TOP UNIT
S	
S/S	START / STOP
SAMP	SAMPLE
SCHED	SCHEDULE
SCHEM	SCHEMATIC
SD	SMOKE DETECTOR
SDMPR	SMOKE DAMPER
SEC	SECONDARY
SECT	SECTION
SEP	SEPARATE
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SMR	SURFACE MOUNTED RACEWAY
SNSR	SENSOR
SOLV	SOLENOID VALVE
SPDT	SINGLE POLE; DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPLY	SUPPLY
SPST	SINGLE POLE; SINGLE THROW
SQ	SQUARE
SS	STAINLESS STEEL
ST	SINGLE THROW; STAIRS; STREET
ST PR	STATIC PRESSURE
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STARTER; STRAIGHT; STRIKE; STRINGERS
STRB	STROBE
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLEMENTARY
SUPVR	SUPERVISOR
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH; SIDEWALK
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL
SYS	SYSTEM
T	
T&M	TIME AND MATERIAL
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRU	THROUGH
TL	TWIST LOCK
TOC	TOP OF CONCRETE; TOP OF CURB
TOL	TOLERANCE
TP	TWISTED PAIR; TELEPHONE POLE
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TV	TELEVISION
TVOUT	TELEVISION OUTLET
TYP	TYPICAL
U	
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UL	UNDER WRITERS LABORATORIES
UTP	UNSHIELDED TWITED PAIR
UTIL	UTILITY
UV	UNIT VENTILATOR; ULTRAVIOLET
V	
V	VOLT
VA	VOLT AMPERE
VAM	VOLTAMMETER
VAR	VARIATION; VARIES; VOLT AMPERE REACTIVE
VD	VOLTAGE DROP; VOLUME DAMPER
VERT	VERTICAL
VF	VARIABLE FREQUENCY
VFD	VARIABLE FREQUENCY DRIVE
VID	VIDEO
VIF	VERIFY IN FIELD
VOLT	VOLTAGE
VR	VOLTAGE REGULATOR; VAPOR RETARDED
VRFY	VERIFY
VRLY	VOLTAGE RELAY
VS	VOLTMETER SWITCH; VENT STACK
W	
W	WIRE; WATT; WASTE; WEST; WIDE
W/	WITH
W/O	WITHOUT
WHM	WATTHOUR METER
WP	WEATHERPROOF; WATER PUMP; WATER HEATER
WR	WEATHER RESISTANT; WATER REPELLENT
WW	WIREWAY; WARM WHITE; WASTE WATER
X	
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY, ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. TV AND TELEPHONE CABLING SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
10. GROUP AND TRAIN ALL TEL/DATA AND CABLE TV CABLE. SUPPORT FROM STRUCTURE.
11. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
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5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
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LIGHTING LEGEND

$	SINGLE POLE SWITCH

ELECTRICAL LEGEND

WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

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WEST VIRGINIA GENERAL SERVICES DIVISION

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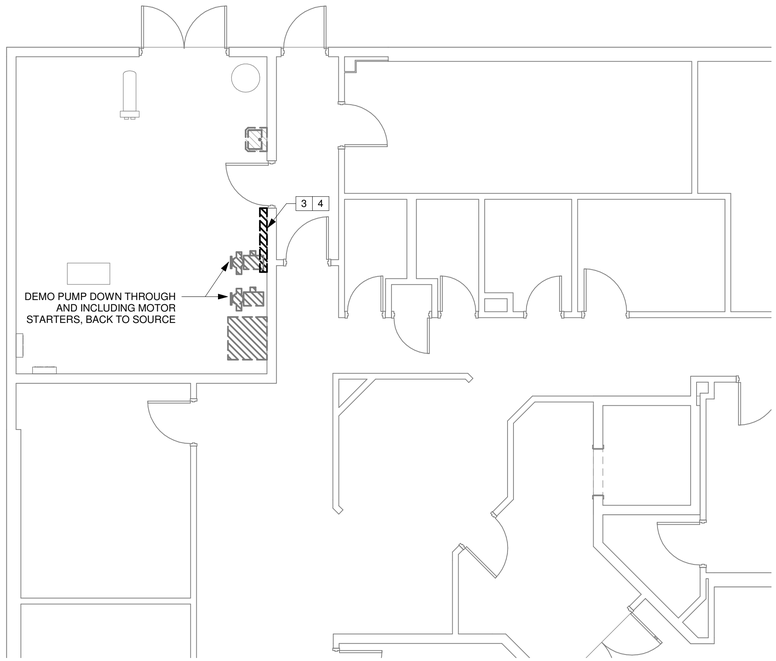
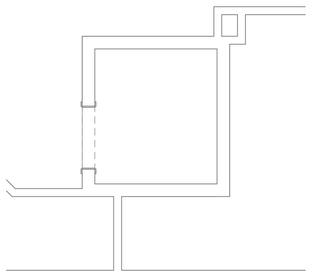
BUILDING #17 - ELECTRICAL ABBREVIATIONS

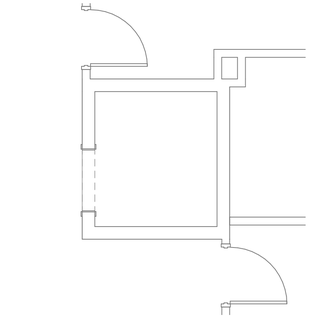
E000-17



1 FIRST FLOOR ELECTRICAL DEMOLITION PLAN
3/16" = 1'-0"



2 SECOND FL. ELEC. DEMO PLAN
1/4" = 1'-0"



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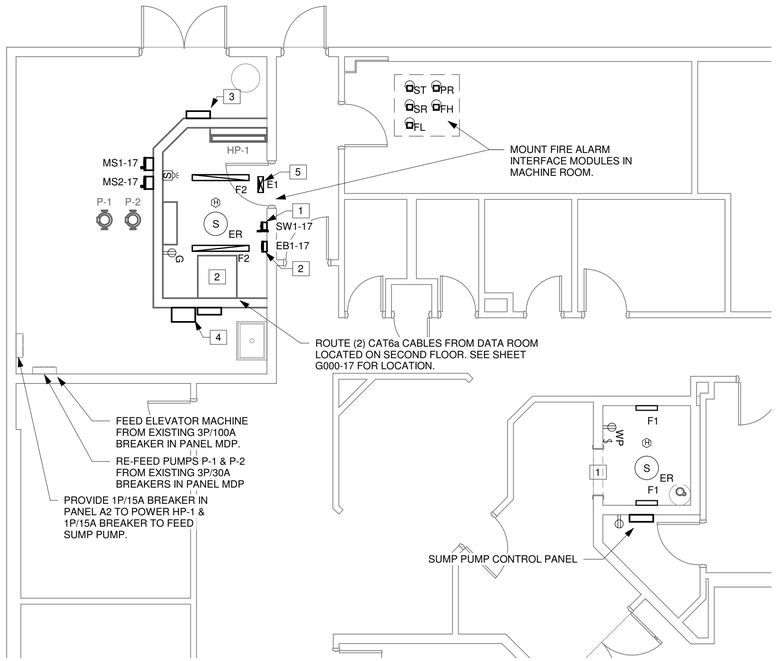

4 FIRST FLOOR ELECTRICAL PLAN
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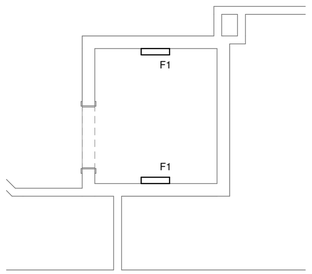

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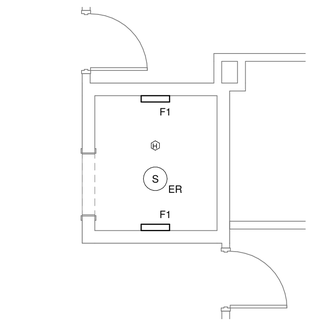

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FIRE ALARM LEGEND

M	MANUAL PULL STATION
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S ER	SMOKE DETECTOR - ELEVATOR RECALL
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ELECTRICAL LEGEND

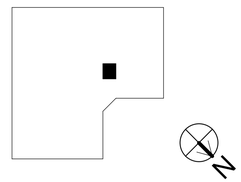
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

LIGHTING LEGEND

$	SINGLE POLE SWITCH

SHEET NOTES

1. FEED ELEVATOR CAR DISCONNECT, SW1-17, & ELEVATOR CAR FROM EXISTING BREAKER.
2. FEED ELEVATOR MACHINE ENCLOSED BREAKER, EB1-17, FROM EXISTING BREAKER. TERMINATE WRING AT ELEVATOR MACHINE PER MFR'S REQUIREMENTS.
3. RELOCATE WALL MOUNTED FIRE ALARM CONTROL PANEL & FIRE ALARM BOOSTER PANELS (2) TO NEW LOCATION. EXTEND CABLING TO NEW LOCATION. COORDINATE RELOCATION W/ OWNER, FIRE ALARM VENDOR, & SECURITY VENDOR PRIOR TO RELOCATION.
4. RELOCATE WALL MOUNTED SECURITY SYSTEM CONTROL PANELS (3), & SECURITY SYSTEM RACK TO NEW LOCATION. EXTEND CABLING TO NEW LOCATION. COORDINATE RELOCATION W/ OWNER, FIRE ALARM VENDOR, & SECURITY VENDOR PRIOR TO RELOCATION.
5. TIE TO NEAREST LIGHT CIRCUIT AHEAD OF SWITCH.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:
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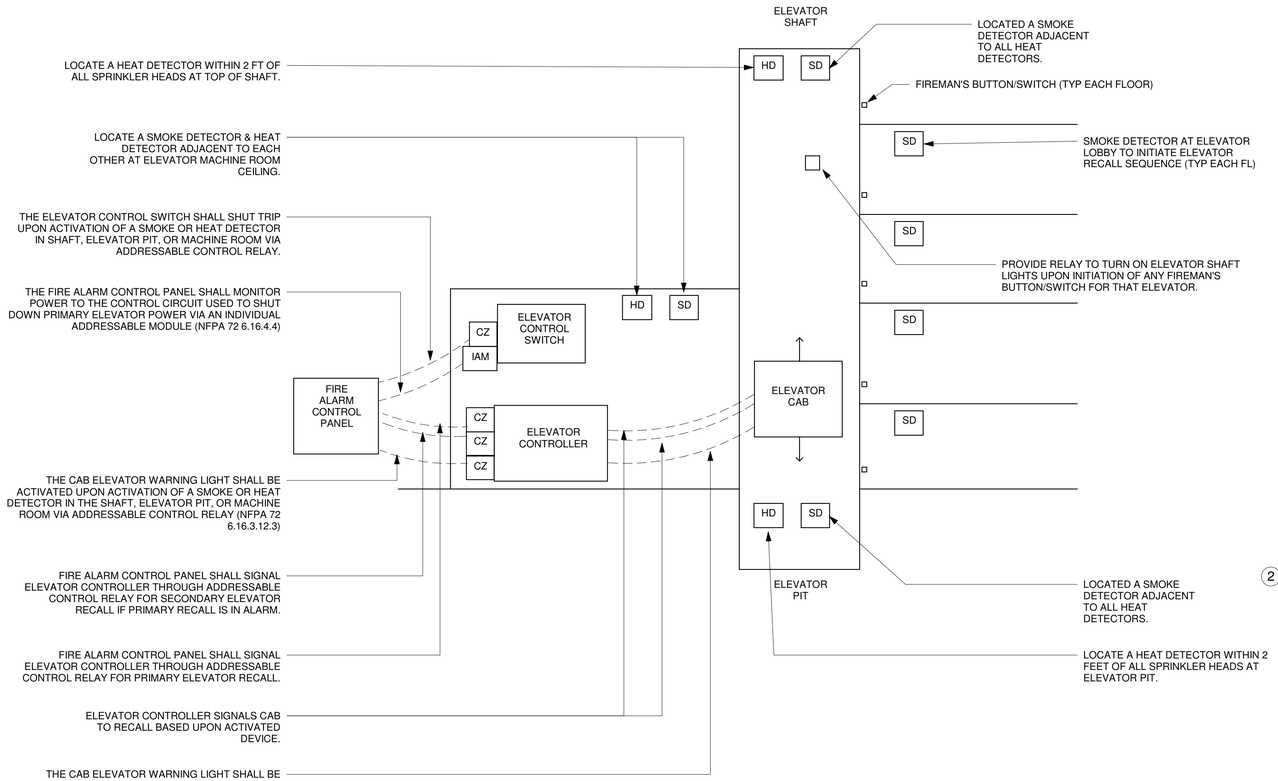
BUILDING #17 - DEMOLITION & NEW ELECTRICAL PLANS

E101-17

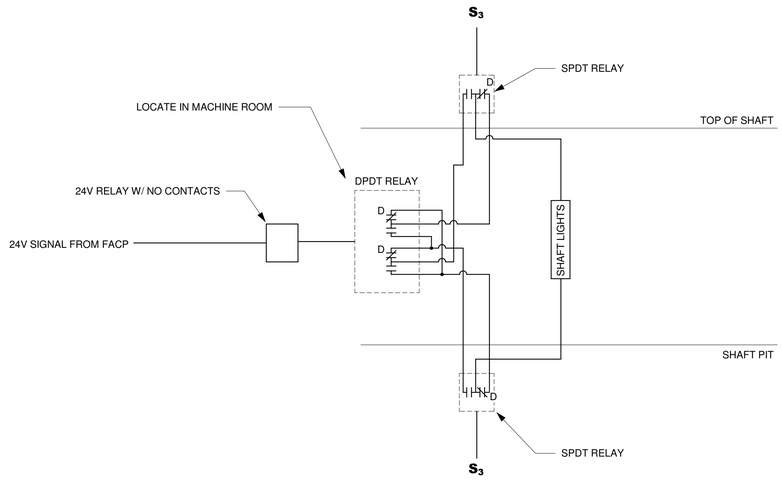


GENERAL NOTES:

1. SMOKE DETECTOR & HEAT DETECTOR TO BE PART OF THE BUILDING'S ADDRESSABLE FIRE ALARM SYSTEM.
2. ALL HEAT DETECTORS TO BE 135 DEGREE TYPE.
3. HEAT DETECTORS (135 DEGREE) SIGNAL THE FIRE ALARM CONTROL PANEL BEFORE ADJACENT SPRINKLER HEAD (165 DEGREE) IS ACTIVATED & FIRE ALARM PANEL SHUT TRIPS ELEVATOR POWER DISCONNECT TO AFFECTED ELEVATOR. SIGNALING OF SHUNT TRIP SHALL BE BY FIRE ALARM CONTROL PANEL THROUGH ADDRESSABLE CONTROL RELAY.
4. CONTROL RELAYS SHALL BE WITHIN 5 FT OF ELEVATOR CONTROLLER.
5. ALL FIRE ALARM CABLING TO ELEVATOR CONTROLLER SHALL BE SUPERVISED.
6. ESTABLISH THE PRIMARY & SECONDARY RECALL IN ACCORDANCE w/ CODE & APPROVED BY THE A.H.J.

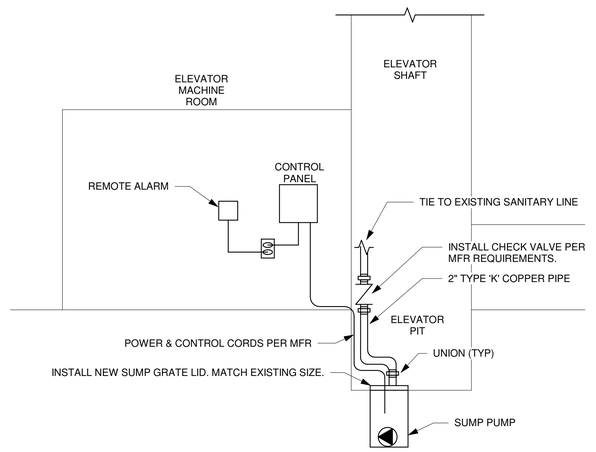
1 ELEVATOR CONTROL SIGNALS DETAIL

DRAWING NOT SCALABLE



2 SHAFT LIGHTING FIRE ALARM INTERFACE DETAIL

DRAWING NOT SCALABLE



3 SUMP PUMP ELECTRICAL DETAIL

DRAWING NOT SCALABLE

LIGHT FIXTURE SCHEDULE

TAG	MFR	MODEL	LUMENS	COLOR TEMP.	VOLTS	WATTS	COMMENTS
F1	LUMINAIRE LED	ESF18-NODIM-50W-40K-MVOLT-CLP-GRY-EMB310-WL-NOOCC	5,280 lm	4,000 K	120-277	50 W	WALL MOUNTED VANDAL RESISTANT LED FIXTURE; CLEAR; PRISMATIC LENS; GRAY HOUSING; WET LOCATION; EMERGENCY BACKUP (1,200 LUMENS)
F2	LITHONIA	CSSL485000LMMVOLTT40K80CRI	5,000 lm	4,000 K	UNV	40 W	LED STRIPLIGHT, DIFFUSE ACRYLIC LENS

DISCONNECT SWITCH SCHEDULE

TAG	SERVES	POLES	VOLTAGE	DEVICE RATING	FUSE	ENCLOSURE	DESCRIPTION
SW1-17	ELEVATOR 1 CAR	2	240 V	30 A	20 A	TYPE1	FUSED SAFETY SWITCH

ENCLOSED BREAKER SCHEDULE

TAG	SERVES	POLES	TRIP	VOLTAGE	ENCLOSURE	DESCRIPTION
EB1-17	ELEVATOR POWER	3	100 A	240 V	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY

MOTOR STARTER SCHEDULE

TAG	SERVES	HP	POLES	VOLTAGE	NEMA SIZE	BREAKER / FUSE	ENCLOSURE	DESCRIPTION
MS1-17	P-1	5	3	208 V	1	30 A	TYPE 1	COMBINATION FVNR STARTER / NON-FUSED DISCONNECT.
MS2-17	P-2	5	3	208 V	1	30 A	TYPE 1	COMBINATION FVNR STARTER / NON-FUSED DISCONNECT.

EXIT & EMERGENCY LIGHTING SCHEDULE

TAG	MFR	MODEL	DESCRIPTION
E1	LITHONIA	LHQMLEDRHOSD	COMBINATION EXIT SIGN & EMERGENCY FIXTURE. WHITE THERMOPLASTIC BODY W/ RED LETTERING.

MILLER ENGINEERING, INC.

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BUILDING #17 - ELECTRICAL DETAILS & SCHEDULES

E501-17

PLUMBING ABBREVIATIONS

A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABLITIES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
B	
BB	BASEBOARD
BC	BALANCING COCK
BD	BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BLR	BOILER
BLW	BELOW
BO	BLOW OFF
BTM	BOTTOM
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CDL	CONDENSATE DRAIN LINE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHKV	CHECK VALVE
CHWR	CHILLED & HOT WATER RETURN
CHWS	CHILLED & HOT WATER SUPPLY
CHWS&R	CHILLED & HOT WATER SUPPLY AND RETURN
CIRC	CIRCULATING
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
CLG	CEILING
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
C/O	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWFT	CONDENSER WATER FROM TOWER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SUPPLY AND RETURN
CWTT	CONDENSER WATER TO TOWER
D	
D	DEEP
Db	DRY BULB TEMPERATURE(ºF)
DCO	DOUBLE CLEAN OUT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM
DISCH	DISCHARGE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPT	DEW POINT TEMPERATURE(ºF)
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
E	
EA	EACH
EC	ELECTRICAL CONTRACTOR
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER(BOTTOMS FLAT)
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATUR(ºF)
F	
ºF	FAHRENHEIT
FA	FREE AREA
FB	FREE BLOW
F&T	FLOAT AND THERMOSTATIC TRAP
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FDN	FOUNDATION
FF	FOULING FACTOR
FIN	FINISHED
FLA	FULL LOAD AMPS
FLG	FLANGE
FLR	FLOOR
FNL	FUNNEL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOS&R	FUEL OIL SUPPLY AND RETURN
FOV	FUEL OIL VENT
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE/FEET
FTG	FITTING
FURN	FURNISH
FV	FACE VELOCITY
FW	FEED WATER
G	
G	GAS
GALV	GALVANIZED
GA	GAUGE, GAGE
GC	GENERAL CONTRACTOR
GCWR	GLYCOL CHILLED WATER RETURN
GCWS	GLYCOL CHILLED WATER SUPPLY
GHWR	GLYCOL HOT WATER RETURN
GHWS	GLYCOL HOT WATER SUPPLY
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAV	GRAVITY
GRV	GRAVITY ROOF VENTILATOR
GV	GATE VALVE
H	
H	HEIGHT
HB	HOSE BIBB
HC	HEATING CONTRACTOR; HANICAPPED
HD	HEAD/HUB DRAIN
HG	MERCURY
HGR	HANGER
HP	HORSEPOWER/HEAT PUMP
HORIZ	HORIZONTAL
HPD	HIGH PRESSURE DRIP
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HTR	HEATER
HUH	HORIZONTAL UNIT HEATER
HV	HIGH VELOCITY
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HWBG	HOT WATER BELOW GRADE
HWOH	HOT WATER OVER HEAD
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IN-WG	INCHES-WATER GAGE
INSUL	INSULATION
IPS	IRON PIPE SIZE
IVS	ISOLATION VALVE STATION
IW	INDIRECT WASTE
J	
JT	JOINT
K	
KS	KITCHEN SINK
L	
L	LENGTH
LAV	LAVATORY
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LOW PRESSURE
LPD	LOW PRESSURE DRIP
LPR	LOW PRESSURE RETURN
LPG	LOW PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LV	LOW VELOCITY
LVG	LEAVING
LWCO	LOW WATER CUTOFF
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MPD	MEDIUM PRESSURE DRIP
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
MS	MINI-SPLIT SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MWT	MEAN WATER TEMPERATURE(ºF)
N	
N	NORTH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
ODS	OXYGEN DEPRIVATION SENSOR
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OFD	OVER FLOW DRAIN
OH	OVERHEAD
OPER	OPERATED
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OUT	OUTLET
OVC	OVERCURRENT
OVF	OVERFLOW
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP/PUMP
PE	PNEUMATIC - ELECTRIC
PG	PRESSURE DROP/PUMP DISCHARGE
PH	PHASE
PLBG	PLUMBING
PNL	PANEL
PR	PANEL RADIATOR
PRESS	PRESSURE
PRV	POWER ROOF VENTILATOR/PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	PRESSURE/TEMPERATURE TAP
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
RA	RELIEF/RETURN AIR
RAD	RADIATOR
RAF	RETURN AIR FIXTURES
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED/RECEIVED
REFRIG	REFRIGERANT
REG	REGISTER
REINF	REINFORCED
REQD	REQUIRED
RET	RETURN
REV	REVISION
RF	RETURN/RELIEF FAN
RH	REHEAT COIL
RHG	REFRIGERANT HOT
RL	REFRIGERANT LIQUID
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
RWC	RAIN WATER CONDUCTOR
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SDPR	SMOKE DAMPER
SENS	SENSIBLE
SEP	SEPARATOR
SF	SUPPLY FAN
SHT	SHEET
SK	SINK
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SPGR	SPECIFIC GRAVITY
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL UNIT
STAT	STATIC
STD	STANDARD
STL	STEEL
STR	STRAINER
SUP	SUPPLY
SV	SAFETY VALVE
SW	SWITCH
T	
TA	THROW AWAY
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TH	THERMOMETER
THK	THICK
TK	TANK
TMV	THRTMOSTATIC MIXING VALVE
TOT	TOTAL
TP	TRAP PRIMER/TRAP PRIMER SUPPLY
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
UC	UNDERCUT
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
V	
V	VOLTAGE/VALVE/VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VFS	VENTURI FLOW STATION
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THROUGH ROOF
W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WA	WATER HAMMER ARRESTER
Wb	WET BULB TEMPERATURE(ºF)
WC	WATER COLUMN/WATER CLOSET
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HEATER
WL	WATER LEVEL
WP	WEATHERPROOF
WT	WEIGHT
Y	
YCO	YARD CLEANOUT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PLUMBING NOTES

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MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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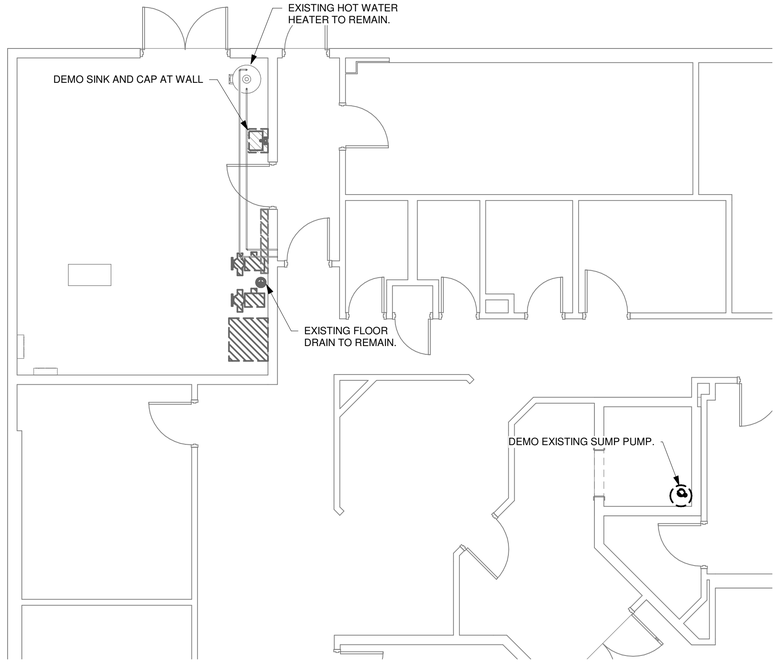
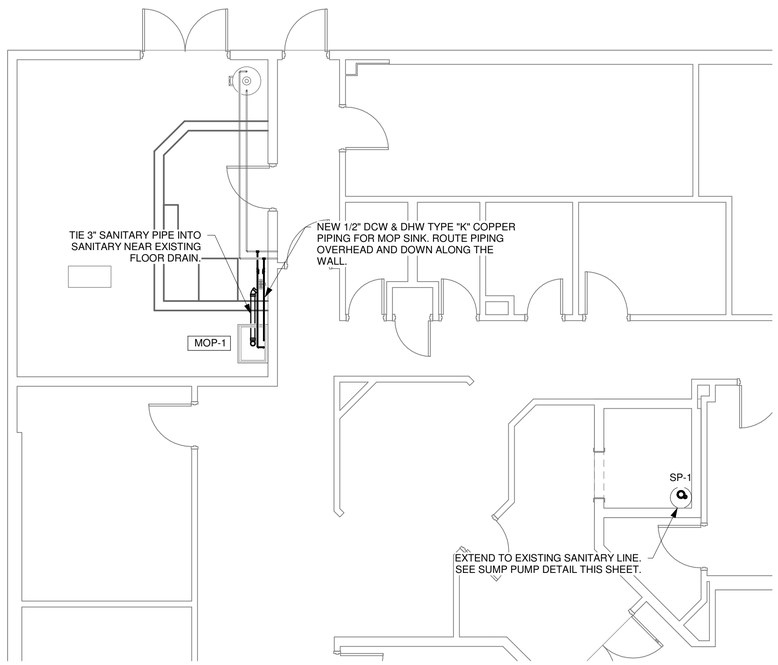
BUILDING #17 - PLUMBING ABBREVIATIONS

P000-17



1 FIRST FLOOR PLUMBING DEMOLITION PLAN

3/16" = 1'-0"



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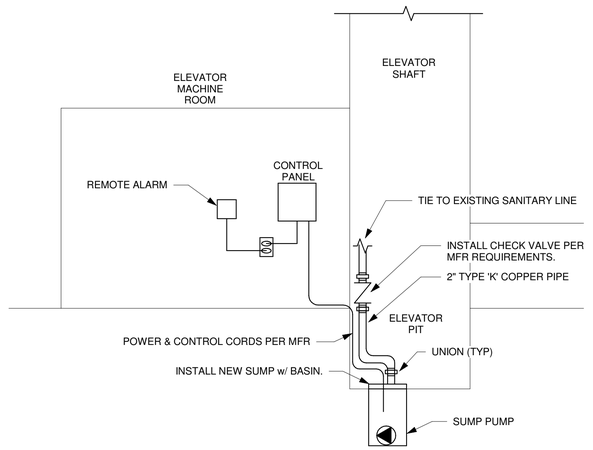

3 SUMP PUMP DETAIL

DRAWING NOT SCALABLE

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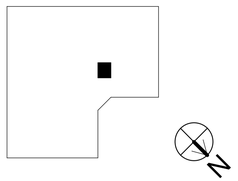
SUMP PUMP SCHEDULE

MARK	SERVES	MFR	MODEL	FLOW RATE	HEAD	HP	PHASE	VOLTS	MCA	MOCP	COMMENTS
SP-1	ELEVATOR #1	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.

PLUMBING FIXTURE SCHEDULE

MARK	MANUFACTURER	MODEL	DESCRIPTION	ACCESSORY DESCRIPTION	PIPING CONNECTIONS			
					DCW	DHW	SAN.	VENT. (MIN)
MOP-1	FIAT PRODUCTS	MSB2424	24" BY 24" MOLDED STONE MOP SERVICE BASIN	PROVIDE w/ THE FOLLOWING: SERVICE FAUCET (830-AA), HOSE AND HOSE BRACKET (832-AA), MOP HANGER (889-CC), SILICONE SEALANT (833-AA). VINYL BUMPERGUARD (E-77-AA), & STAINLESS STEEL WALL GUARD (MSG2424)	1/2"	1/2"	3"	1-1/2"



KEY PLAN

N.T.S.

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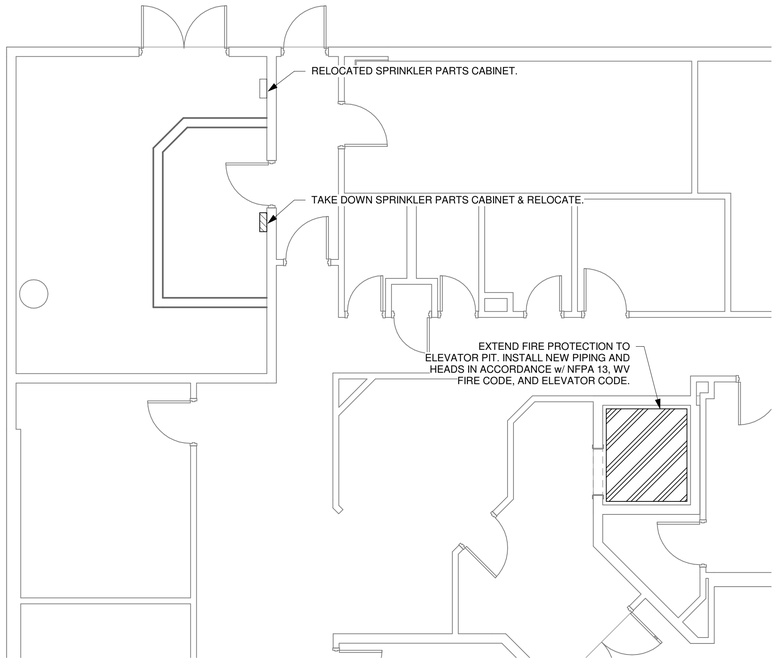
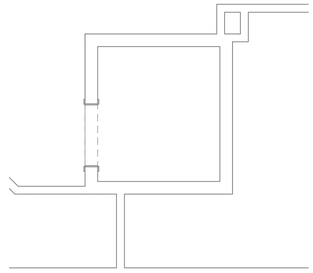
BUILDING #17 - DEMOLITION & NEW PLUMBING PLANS

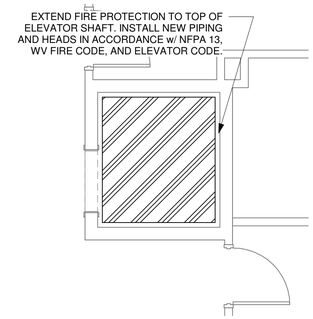
P101-17



1 FIRST FLOOR FIRE PROTECTION PLAN
3/16" = 1'-0"



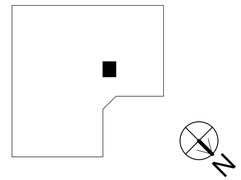
2 SECOND FL. FP PLAN
1/4" = 1'-0"



3 THIRD FL. FP PLAN
1/4" = 1'-0"

FIRE PROTECTION NOTES

1. PROVIDE FIRE PROTECTION SYSTEM DESIGN AND INSTALLATION AS NECESSARY TO MEET CODES, STANDARDS, AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ) AND INSURANCE UNDERWRITERS.
2. COORDINATE ALL WORK w/ OTHER TRADES PRIOR TO THE FABRICATION OR INSTALLATION OF ANY PIPING.
3. PROVIDE SYSTEM DEVICES, PIPING, AND COMPONENTS AS NECESSARY TO INSTALL A COMPLETE FIRE PROTECTION SYSTEM. THE EXISTING SYSTEM COMPONENTS AND PIPING MAY BE REUSED w/ THE APPROVAL OF THE AHJ.
4. RETAIN THE SERVICES OF A NICET LEVEL 4 SYSTEM DESIGNER TO DESIGN AND LAYOUT THE FULL SYSTEM AS NECESSARY TO MEET THE CURRENT NFPA, STATE, AND LOCAL REQUIREMENTS. ZONE THE FIRE PROTECTION SYSTEM AS NECESSARY. PROVIDE ALL DEVICES AS REQUIRED FOR THE INSTALLATION OF A COMPLETE, TEST INSPECTED, CODE COMPLIANT SYSTEM. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ.
5. SUBMIT DETAILED FIRE PROTECTION DRAWINGS, HYDRAULIC CALCULATIONS, & ALL ITEMS STATED ON THE ICC CHECKLIST TO THE CODE REVIEW OFFICIAL. AFTER THE APPROVAL OF THE CODE REVIEW OFFICIAL, SEND THE FIRE PROTECTION DRAWINGS & HYDRAULIC CALCULATIONS TO THE ARCHITECT & ENGINEER FOR APPROVAL.
6. DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR MUST FIELD VERIFY ACTUAL CONDITIONS AT THE SITE PRIOR TO PRECEDING w/ THE WORK.
7. COORDINATE w/ LOCAL UTILITY BOARD PRIOR TO THE START OF DESIGN. COPY DESIGN BASIS FLOW TEST DATA TO THE OWNER.
8. PROVIDE DEVICES AND INTERCONNECTION TO THE FIRE ALARM SYSTEM FOR ALL ZONING, NOTIFICATION, AND ALARM AS REQUIRED. COORDINATE w/ FIRE ALARM CONTRACTOR PRIOR TO BIDDING.
9. CENTER HEADS IN CEILING TILES. VERIFY BEFORE INSTALLATION THE EXACT CEILING TYPE & PATTERN.
10. COORDINATE FINAL LOCATIONS OF SPRINKLER HEADS, PIPING, & ALL NEW WORK w/ LIGHT FIXTURES, DIFFUSERS, GRILLES, SMOKE DETECTORS, SPEAKERS, & OTHER CEILING MOUNTED DEVICES. MAKE MINOR MODIFICATIONS TO SUIT.
11. PROVIDE SLEEVES & FIRESTOP SEALANTS WHERE PIPES PENETRATE FIRE RATED FLOORS & WALLS. COMPLY w/ ASTM E-814 & UL 1479.
12. CONFORM TO ICC, FM, NFPA REQUIREMENTS AND/OR OWNER'S INSURANCE UNDERWRITER. OBTAIN PERMITS & REVIEW STAMPS FROM THE A.H.J.
13. PIPING IS TO BE INSTALLED ABOVE CEILING UNLESS OTHERWISE NOTED.
14. ALL CONTROL VALVES SHALL BE MONITORED.
15. THE SPRINKLER SYSTEM SHALL BE DESIGNED & SIZED BY THE SPRINKLER CONTRACTOR. THESE DOCUMENTS SHALL BE USED AS A GUIDE FOR INTENT ONLY. FAST RESPONSE SPRINKLER HEADS ARE TO BE USED WHERE POSSIBLE BY CODE. SPRINKLER CONTRACTOR SHALL INFORM & COORDINATE ALL ELECTRICAL & FIRE ALARM DEVICES w/ THE ELECTRICAL CONTRACTOR.
16. INSPECTOR'S TEST VALVES SHALL NOT DRAIN ONTO CONCRETE SIDEWALKS, PADS, OR CONCRETE PLAZA'S DUE TO STAINING. IF DRAINING TO GRASS AREA PROVIDE MEANS TO ELIMINATE MUD OF THEIR DEBRIS FROM SPLASHING ONTO BUILDING.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:
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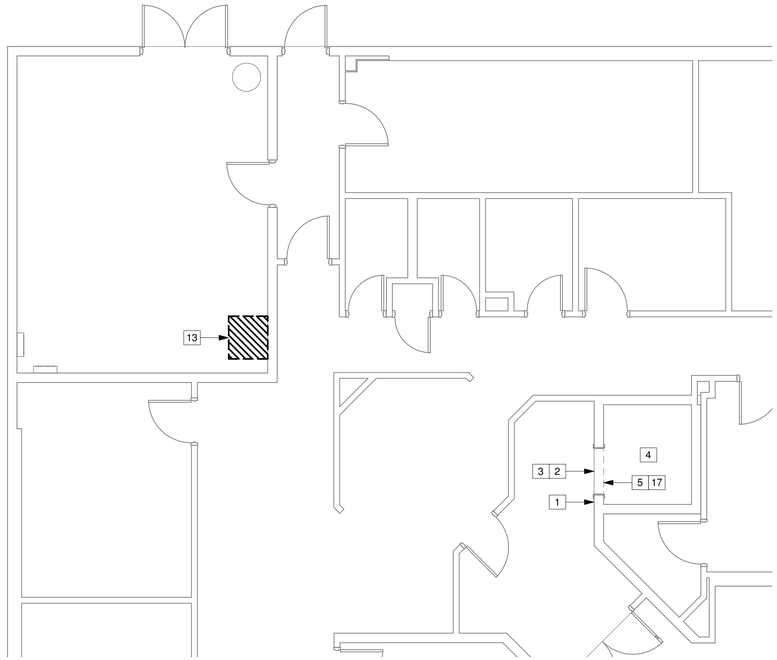
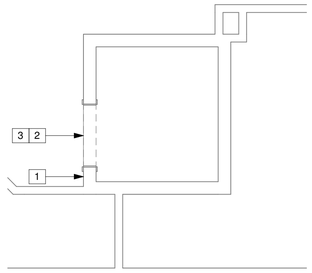
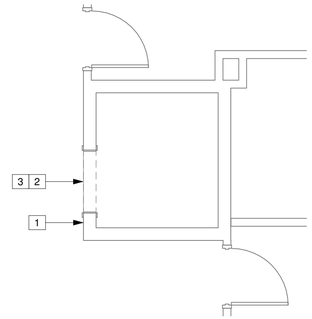
F101-17



1 FIRST FLOOR EQUIPMENT DEMOLITION PLAN
3/16" = 1'-0"



2 SECOND FL. EQUIP. DEMO PLAN
1/4" = 1'-0"



3 THIRD FL. EQUIP. DEMO PLAN
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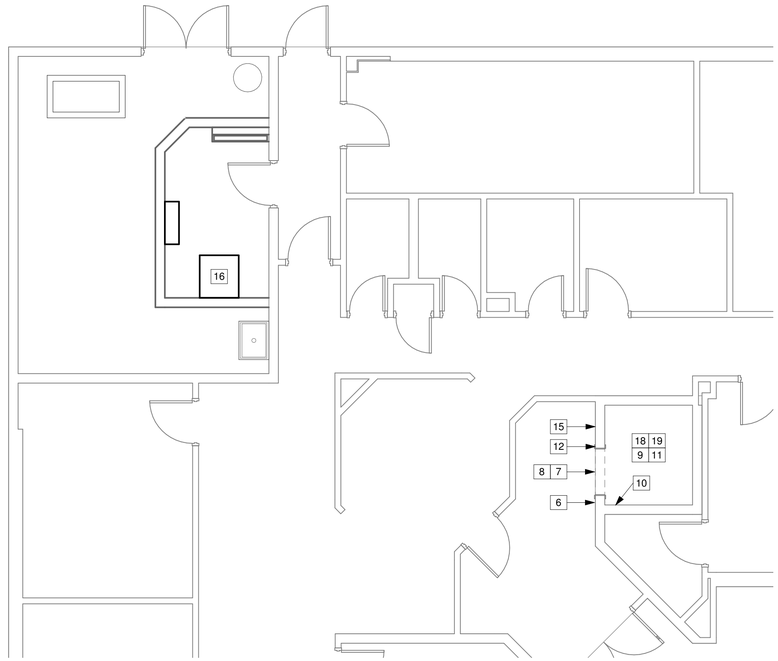
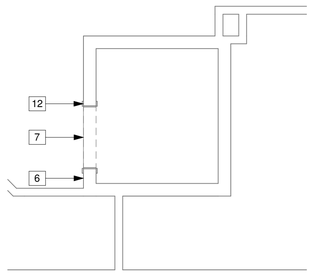


4 FIRST FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



5 SECOND FL. EQUIP PLAN
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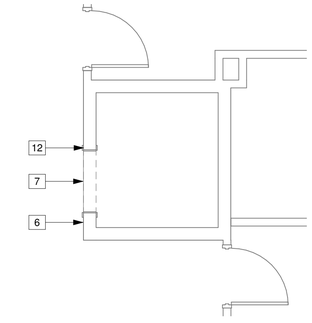

6 THIRD FL. EQUIP PLAN
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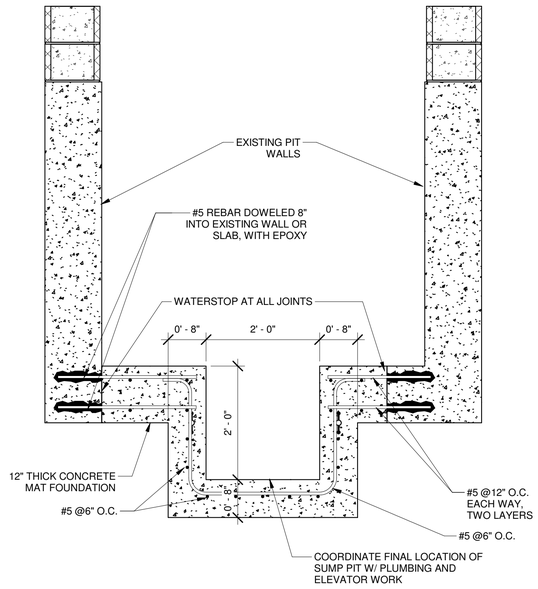
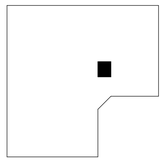


7 ELEVATOR PIT DETAIL
DRAWING NOT SCALABLE

SHEET NOTES

1. DEMO HALL CALL.
2. DEMO HALL FLAGS.
3. DEMO DOOR OPERATOR SYSTEM.
4. DEMO EXISTING BUFFERS CYLINDER.
5. DEMO EXISTING PIT LADDER.
6. INSTALL NEW HALL CALL TO FIT IN EXISTING ROUGH-INS WITHOUT ADAPTERS.
7. INSTALL NEW CAR FLOOR INDICATOR TO FIT IN EXISTING ROUGH-INS WITHOUT ADAPTERS.
8. INSTALL NEW DOOR OPERATING SYSTEM.
9. INSTALL NEW BUFFERS AND CYLINDER.
10. INSTALL NEW PIT LADDER w/ STOP SWITCH.
11. ELEVATOR CAB TO BE RETROFITTED OR REPLACED TO ACCOMMODATE AN ADA VIDEO PHONE.
12. DOOR JAMBS ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND REPAINTED, IF NEEDED, COLOR BY ARCHITECT.
13. DEMO ELEVATOR HYDRAULIC MACHINE, ETC. FOR COMPLETE REPLACEMENT INCLUDING FENCING.
14. INSTALL NEW PUMP UNIT.
15. PROVIDE NEW SEPARATE FIRE MAN'S HAT.
16. INSTALL NEW ELEVATOR CONTROLLER.
17. PAN OFF TOE CATCH WITHIN HOISTWAY AS NECESSARY TO MEET ANSI STANDARDS.
18. APPLY XYPEX CONCENTRATE (OR SIMILAR) BASE COAT AND XYPEX MODIFIED (OR SIMILAR) TOP COAT ON VERTICAL AND HORIZONTAL SURFACES IN EXISTING ELEVATOR PITS BELOW THE BOTTOM FLOOR LEVEL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
19. INSTALL RETROFIT WATERSTOPS AT PATCHED CONCRETE WITHIN ELEVATOR PITS.



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MORGANTOWN, WV 26508
PH: (304) 291-2234
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CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
BRIAN C. MILLER
REGISTERED
15184
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITES (PHASE 2): B5, B15, B17, B84, & B86

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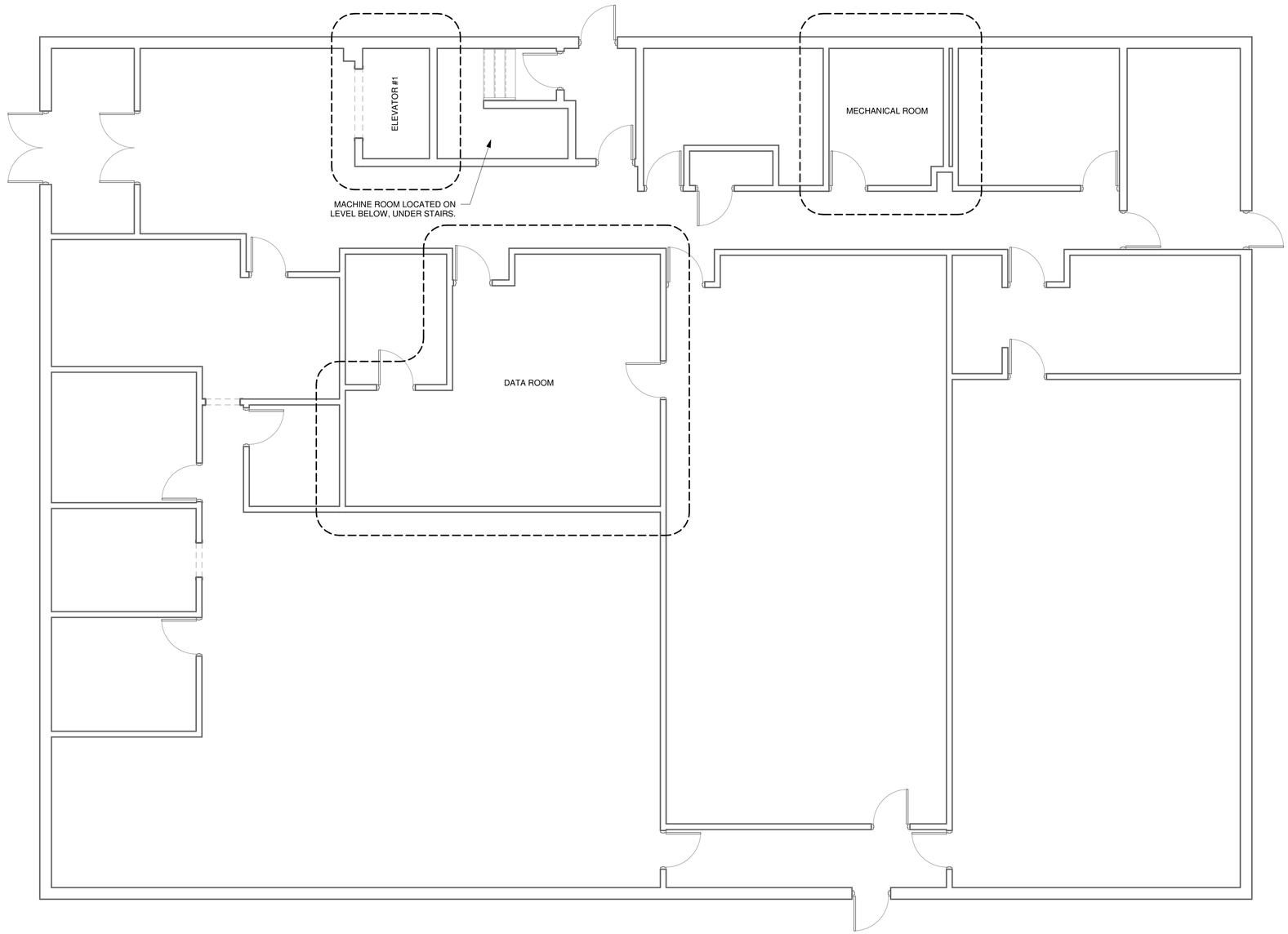

1 REFERENCE MASTER FLOOR PLAN - FIRST FLOOR

3/16" = 1'-0"

KEY PLAN

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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
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304-276-7151
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GENERAL BUILDING
LAYOUT

G000-84

MECHANICAL ABBREVIATIONS

SYMBOLS	
#	NUMBER
&	AND
°	DEGREES
ºF	DEGREES FAHRENHEIT
A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
AUX	AUXILIARY
AVG	AVERAGE
B	
BFV	BUTTERFLY VALVE
BH	BASEBOARD HEATER
BHP	BRAKE HORESPOWER
BLR	BOILER
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CHKV	CHECK VALVE
CIRC	CIRCULATING
CI	CAST IRON
CKT	CIRCUIT
CMU	CONCRETE MASONARY UNIT
C/O	CLEAN OUT
CON	CONDENSATE
CONT	CONTINUATION
CT	COOLING TOWER
CU	CONDENSING UNIT
D	
DIA	DIAMETER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE(ºF)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE(ºF)
F	
ºF	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	
GAS	NATURAL GAS
GALV	GALVANIZED
GA	GAUGE
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	
HCWL	HYDRONIC CHILLED WATER LOOP
HCWR	HYDRONIC CHILLED WATER RETURN
HCWS	HYDRONIC CHILLED WATER SUPPLY
HHWL	HYDRONIC HOT WATER LOOP
HHWR	HYDRONIC HOT WATER RETURN
HHWS	HYDRONIC HOT WATER SUPPLY
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
J	
JB	JUNCTION BOX
K	
KW	KILOWATT
KWH	KILOWATT HOUR
L	
LAT	LEAVING AIR TEMPERATURE(ºF)
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LIQUID PROPANE
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MS	MINI-SPLIT SYSTEM
N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
Q	
QTY	QUANTITY
R	
RA	RETURN AIR
RAD	RADIATOR
RCP	RADIANT CEILING PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SMOKE DAMPER
SENS	SENSIBLE
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T	
T	THERMOSTATE
TA	TRANSFER AIR
TCV	TEMPERATURE CONTROL VALVE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TSTAT	THERMOSTAT
TV	TURNING VANES
TYP	TYPICAL
U	
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	
VOLTS	VOLTAGE
VA	VOLT AMPERES
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VOLTS	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VVT	VARIABLE VOLUME AND TEMPERATURE
W	
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WT	WEIGHT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, SPECIFICATIONS, AND REQUIRED BY CODE.
2. PROVIDE BALL VALVE STOPS AT ALL FIXTURES. PROVIDE UNIONS, DIRT LEGS, AND REGULATORS ON ALL EQUIPMENT.
3. COORDINATE ALL STUB-UPS AND FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS.
4. UNLESS OTHERWISE NOTED, ALL PIPING IS TO BE OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OR DECK w/ SPACE FOR INSULATION.
5. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, ETC. ARE ACCESSIBLE.
6. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED w/ POSITION INDICATORS AND MANUAL ADJUSTABLE STOPS.
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11. PROVIDED FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS.
12. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERNATIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, APPLICABLE LOCAL CODES, LOCAL UTILITY REQUIREMENTS, AND THE INTERNATIONAL FUEL GAS CODE.
13. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ECT. IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

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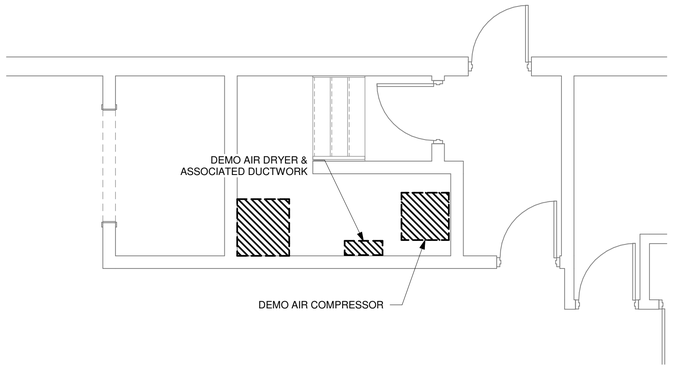
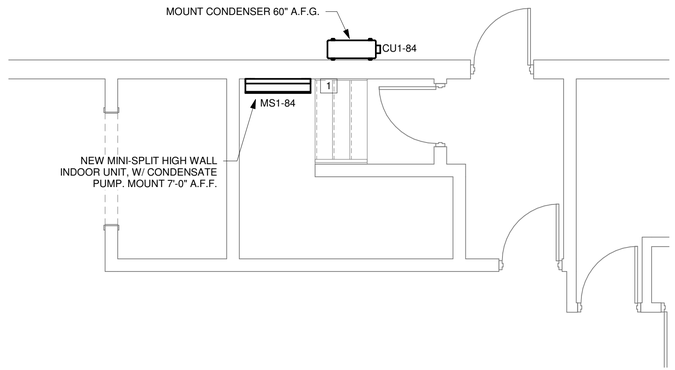
BUILDING #84 -
MECHANICAL
ABBREVIATIONS

M000-84



1 FIRST FLOOR MECHANICAL DEMO PLAN
1/4" = 1'-0"



2 FIRST FLOOR MECHANICAL PLAN
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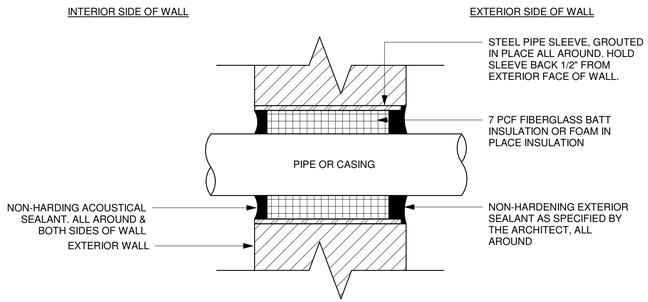
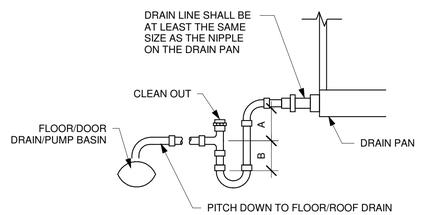


GENERAL NOTES:
1. WHERE EXPOSED TO ROOM, PROVIDE ESCUTCHEON TRIM.
2. NO MORTAR BRIDGING BETWEEN PIPE & CMU. NO CONCRETE BRIDGING ON POURED WALLS.
3. SUPPORT PIPE TO PREVENT CONTACT w/ SLEEVE.

3 EXTERIOR WALL PIPE PENETRATION DETAIL
DRAWING NOT SCALABLE



UNIT TYPE	A	B
DRAW THROUGH	P+1"	P
BLOW THROUGH	2" MIN.	2P

P = STATIC PRESSURE OF UNITS IN INCHES OF H20

4 CONDENSATE DRAIN DETAIL
DRAWING NOT SCALABLE

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11. PROVIDED FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS.
12. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERNATIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, APPLICABLE LOCAL CODES, LOCAL UTILITY REQUIREMENTS, AND THE INTERNATIONAL FUEL GAS CODE.
13. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ECT. IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

SHEET NOTES

1. ROUTE REFRIGERANT PIPING INSIDE BUILDING TO THE GREATEST EXTENT POSSIBLE. IF EXPOSED OUTSIDE, USE LINESET COVER DUCT, COLOR TBD.

MINI-SPLIT UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SYSTEM SERVED	COOLING CAPACITY	ELECTRICAL DATA	
					VOLTAGE	PHASE
MS1-84	CARRIER	40MHHC18---3	CU1-84	18,000 Btu/h	208 V	1

CONDENSER UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SYSTEM SERVED	COOLING CAPACITY	ELECTRICAL DATA			
					VOLTAGE	PHASE	MCA	MOCP
CU1-84	CARRIER	38MHRBC18AA3	MS1-84	18,000 Btu/h	208 V	1	15.0 A	20 A

KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:


PROJECT NAME:
ELEVATOR MODERNIZATION VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

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BUILDING #84 - DEMOLITION & NEW MECHANICAL PLANS

M101-84

ELECTRICAL ABBREVIATIONS

1P	SINGLE POLE
1PH	SINGLE-PHASE
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3WAY	THREE-WAY
4/C	FOUR-WIRE
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4WAY	FOUR-WAY
4W	FOUR-WIRE
ø	PHASE
A	
A	AMPERE
AC	ALTERNATING CURRENT; ARMORED CABLE
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
A/E	ARCHITECT/ENGINEER
AFC	ABOVE FINISHED COUNTER
AFCI	ARC FAULT CIRCUIT INTERUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANN	ANNUNCIATOR
APPD	APPROVED
APPROX	APPROXIMATELY; APPROXIMATE
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING; AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
ATTN	ATTENTION
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AVG	AVERAGE
AWG	AMERICAN WRE GAUGE
B	
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BFF	BELOW FINISHED FLOOR
BG	BELOW GRADE
BKBD	BACKBOARD
BLDG	BUILDING
BLT	BUILT
BLW	BELOW
BOT	BOTTOM
BPS	BOLTED PRESSURE SWITCH
BRKR	BREAKER
BSMT	BASEMENT
BTWN	BETWEEN
BX	INTERLOCKED ARMORED CABLE
BYP	BYPASS
C	
C	CELSIUS
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION SYSTEM
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CD	CANDELA; CONSTRUCTION DOCUMENTS;
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CIR	CIRCLE
CKT	CIRCUIT
C	CENTERLINE
CL	CURRENT LIMITING; CENTER LINE; CLASS; CLOSE
CLG	CEILING
CLR	CLEAR
CND	CONDUIT
COAX	COAXIAL
COL	COLUMN
COMB	COMBINATION; COMBINED
COMM	COMMUNICATION
COMPR	COMPRESSOR
CONC	CONCRETE
CONN	CONNECT
CORR	CORRIDOR; CORRECT
CP	CONTROL PANEL
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTR	CENTER
CTRL	CONTROL
CU	COPPER; COEFFICIENT OF UTILIZATION; CUBIC
CU FT	CUBIC FEET
CUR	CURRENT
D	
D	DEPTH
DB	DIRECT BURIAL / DECIBEL
DBL	DOUBLE
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DEL	DELETE; DELIVER
DEMO	DEMOLITION; DEMONSTRATION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM; DIAGONAL
DIFF	DIFFERENCE
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE; DISTRICT
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION; DIVIDE
DN	DOWN
DOC	DOCUMENT
DPDT	DOUBLE POLE; DOUBLE THROW
DPST	DOUBLE POLE; SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING
E	
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ELR	END OF LINE RESISTOR
EM	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENGR	ENGINEER
ENGY	ENERGY
ENT	ELECTRICAL NONMETALLIC TUBING
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EST	ESTIMATE
ESTB	ESTABLISH
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION; EXPOSED; EXPAND
EXT	EXTERIOR; EXTERNAL
EXTN	EXTENSION
F	
F	FAHRENHEIT; FEMALE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FOOT-CANDLE
FCU	FAN COIL UNIT
FDR	FEEDER
FIN	FINISH
FIN GR	FINISH GRADE
FIXT	FIXTURE
FL MT	FLUSH MOUNT
FLEX	FLEXIBLE
FLG	FLOORING
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FREQUENCY MODULATION
FP	FIREPROOF
FR	FIRE RESISTANT
FREQ	FREQUENCY
FS	FUSIBLE SWITCH; FLOW SWITCH
FSC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET; FIRE TREATED; FOOT
FU	FUSE
FU SW	FUSED SWITCH
FURN	FURNISH; FURNACE; FURNITURE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL; GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GOVT	GOVERNMENT
GRN	GROUND
GYP	GYPSUM
H	
HDW	HARDWARE
HF	HIGH FREQUENCY
HID	HIGH INTENSITY DISCHARGE
HO	HOLD OPEN
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER; HEAT PUMP; HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ; FREQUENCY IN CYCLES PER SECOND
I	
ID	INSIDE DIAMTER; INSIDE DIMENSION; IDENTIFICATION
ILLUM	ILLUMINATION
IMC	INTERMEDIATE METAL CONDUIT
INFO	INFORMATION
INSUL	INSULATION
INTERCOM	INTERCOMMUNICATION
INTL	INTERNATIONAL
IR	INFRARED; INSIDE RADIUS
IT	INFORMATION TECHNOLOGY
J	
JB	JUNCTION BOX
K	
KCMIL	THOUSAND CIRCULAR MILS
KHz	KILOHERTZ
KIT	KITCHEN
KO	KNOCKOUT
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kVAh	KILOVOLT AMPERE PER HOUR
kVAR	KILOVAR; KILOVOLT AMPERE REACTIVE
kW	KILOWAT
kWh	KILOWATT HOURS
L	
L	LITER; ANGLE
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LM	LUMEN
LOC	LOCATION
LP	LIGHT POLE; LOW PRESSURE
LPW	LUMENS PER WATT
LT	LIGHT
LT SW	LIGHT SWITCH
LTD	LIMITED
LTG	LIGHTING
LV	LOW VOLTAGE
M	
M	METER
mA	MILLIAMPERE
MACH	MACHINE
MAG	MAGNET
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMIM
MC	MECHANICAL CONTRACTOR; METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MED	MEDICAL; MEDIUM
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MH	MANHOLE; METAL HALIDE
MHZ	MEGAHERTZ
MI	MINERAL INSULATED
MIC	MICROPHONE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOA	MULTIOUTLET ASSEMBLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MODIFY; MODULE
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MEETING; MOUNTING
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MULT	MULTIPLE
mV	MILLIVOLT
MVA	MEGAVOLT-AMPERE
MW	MEGAWATT; MICROWAVE
mW	MILLIWATT
MWH	MEGAWATT HOUR
N	
N	NORTH
NC	NORMALLY CLOSED
NE	NORMAL EMERGENCY
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN; NUMBER
NORM	NORMAL
NTS	NOT TO SCALE
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OH	OVERHEAD
OL	OVERLOAD ELEMENT
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OVC	OVERCURRENT
P	
P	POLE (S); PILOT
PA	POWER AMPLIFIER; PUBLIC ADDRESS
PART	PARTIAL
PB	PULL BOX; PANEL BOARD; PANIC BAR; PUSH-BUTTON
PC	PLUMBING CONTRACTOR; PIECE
PE	PHOTOELECTRIC, PNEUMATIC ELECTRIC
PEN	PENETRATE
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PLBG	PLUMBING
PNL	PANEL
POS	POSITION; POSITIVE
PP	POWER POLE
PR	PAIR
PRELIM	PRELIMINARY
PREP	PREPARATION
PRESS SW	PRESSURE SWITCH
PREV	PREVIOUS
PRI	PRIMARY
PROJ	PROJECT
PS	PULL STATION
PT	POTENTIAL TRANSFORMER
PVC	POLYVINAL CHLORIDE (PLASTIC)
PWR	POWER
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QTY	QUANTITY
QUAL	QUALITY
R	
R	RELAY; RADIUS
R/W	RIGHT OF WAY
RC	REMOTE CONTROL
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RCPT	RECEPTACLE
REF	REFRIGERATOR; REFERENCE
REINF	REINFORCED
REPL	REPLACE
REQD	REQUIRED
REV	REVISION; REVOLUTIONS
RFI	REQUEST FOR INFORMATION
RFP	REQUEST FOR PROPOSAL
RH	RIGHT HAND
RHC	REHEAT COIL
ROW	RIGHT OF WAY
RS	RAPID START
RTG	RATING
RTU	ROOF TOP UNIT
S	
S/S	START / STOP
SAMP	SAMPLE
SCHED	SCHEDULE
SCHEM	SCHEMATIC
SD	SMOKE DETECTOR
SDMPR	SMOKE DAMPER
SEC	SECONDARY
SECT	SECTION
SEP	SEPARATE
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SMR	SURFACE MOUNTED RACEWAY
SNSR	SENSOR
SOLV	SOLENOID VALVE
SPDT	SINGLE POLE; DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPLY	SUPPLY
SPST	SINGLE POLE; SINGLE THROW
SQ	SQUARE
SS	STAINLESS STEEL
ST	SINGLE THROW; STAIRS; STREET
ST PR	STATIC PRESSURE
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STARTER; STRAIGHT; STRIKE; STRINGERS
STRB	STROBE
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLEMENTARY
SUPVR	SUPERVISOR
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH; SIDEWALK
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL
SYS	SYSTEM
T	
T&M	TIME AND MATERIAL
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRU	THROUGH
TL	TWIST LOCK
TOC	TOP OF CONCRETE; TOP OF CURB
TOL	TOLERANCE
TP	TWISTED PAIR; TELEPHONE POLE
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TV	TELEVISION
TVOUT	TELEVISION OUTLET
TYP	TYPICAL
U	
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UL	UNDER WRITERS LABORATORIES
UTP	UNSHIELDED TWITED PAIR
UTIL	UTILITY
UV	UNIT VENTILATOR; ULTRAVIOLET
V	
V	VOLT
VA	VOLT AMPERE
VAM	VOLTAMMETER
VAR	VARIATION; VARIES; VOLT AMPERE REACTIVE
VD	VOLTAGE DROP; VOLUME DAMPER
VERT	VERTICAL
VF	VARIABLE FREQUENCY
VFD	VARIABLE FREQUENCY DRIVE
VID	VIDEO
VIF	VERIFY IN FIELD
VOLT	VOLTAGE
VR	VOLTAGE REGULATOR; VAPOR RETARDED
VRFY	VERIFY
VRLY	VOLTAGE RELAY
VS	VOLTMETER SWITCH; VENT STACK
W	
W	WIRE; WATT; WASTE; WEST; WIDE
W/	WITH
W/O	WITHOUT
WHM	WATTHOUR METER
WP	WEATHERPROOF; WATER PUMP; WATER HEATER
WR	WEATHER RESISTANT; WATER REPELLENT
WW	WIREWAY; WARM WHITE; WASTE WATER
X	
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F S	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY, ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. TV AND TELEPHONE CABLING SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
10. GROUP AND TRAIN ALL TEL/DATA AND CABLE TV CABLE. SUPPORT FROM STRUCTURE.
11. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
12. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
13. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

ELECTRICAL LEGEND

WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

LIGHTING LEGEND

$	SINGLE POLE SWITCH

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

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ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA
GENERAL SERVICES
DIVISION

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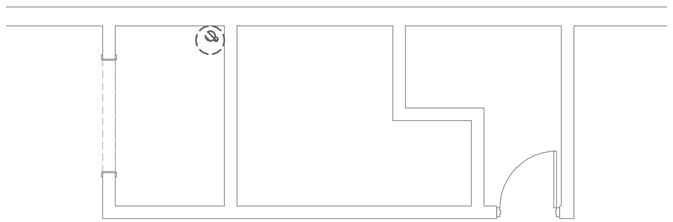
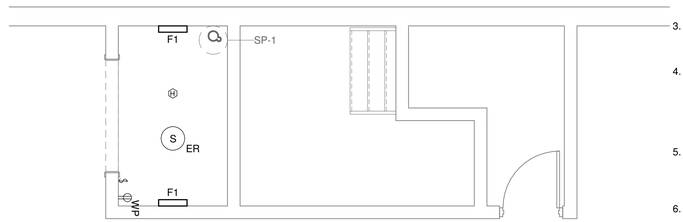
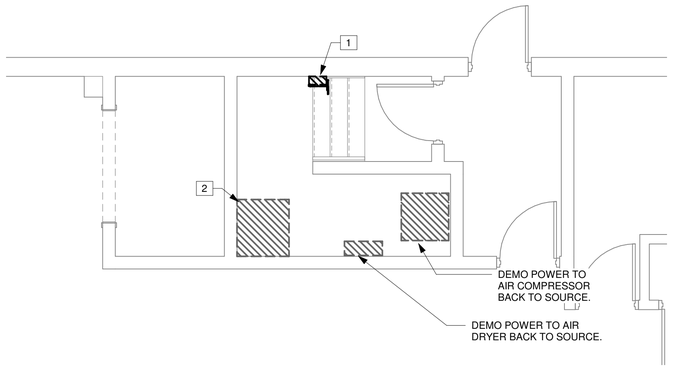


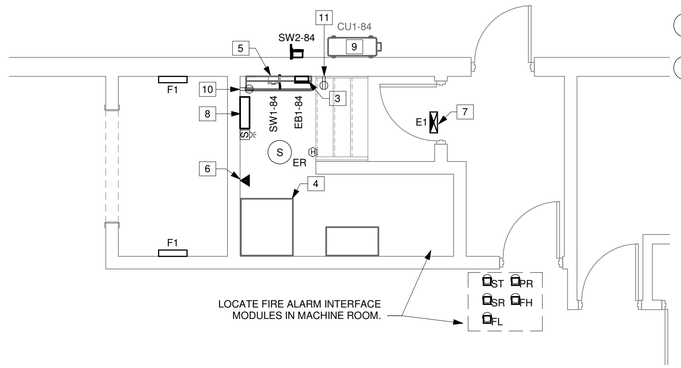
1 BASEMENT ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"



2 BASEMENT ELECTRICAL PLAN
1/4" = 1'-0"



3 FIRST FLOOR ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"



4 FIRST FLOOR ELECTRICAL PLAN
1/4" = 1'-0"

5 SECOND FLOOR ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"

6 SECOND FLOOR ELECTRICAL PLAN
1/4" = 1'-0"

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4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. TV AND TELEPHONE CABLING SHALL BE INSTALLED FROM LOCATIONS INDICATED ON DRAWINGS TO DEMARC LOCATION. COORDINATE FINAL DEMARC LOCATIONS w/ TV AND TELEPHONE COMPANY.
10. GROUP AND TRAIN ALL TEL/DATA AND CABLE TV CABLE. SUPPORT FROM STRUCTURE.
11. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
12. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
13. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

ELECTRICAL LEGEND

$ WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF

LIGHTING LEGEND

$	SINGLE POLE SWITCH

SHEET NOTES [#]

1. DEMO ELEVATOR DISCONNECT. MAKE SAFE LINE SIDE WIRING FOR TERMINATION TO NEW ENCLOSED BREAKER.
2. DEMO POWER TO ELEVATOR CONTROLLER BACK TO DISCONNECT.
3. RE-TERMINATE LINE SIDE WIRING ON NEW ENCLOSED BREAKER, EB1-84.
4. INSTALL NEW WIRING FROM EB1-84 TO ELEVATOR CONTROLLER & WIRING TO PUMP UNIT. WIRING PER EQUIPMENT MFR'S REQUIREMENTS.
5. INSTALL NEW ELEVATOR CAR DISCONNECT, SW1-84. RE-FEED DISCONNECT FROM EXISTING ELEVATOR CAR POWER CIRCUIT. INTERCEPT EXISTING CONDUIT AT DOOR LOCATION. PROVIDE NEW CONDUIT FROM DOOR TO DISCONNECT. EXTEND WIRING TO ELEVATOR CAR LIGHTS & HVAC PER MFR'S REQUIREMENTS.
6. INSTALL (2) CAT6a CABLES FROM DATA ROOM TO ELEVATOR MACHINE ROOM. SEE SHEET G000-84 FOR LOCATION.
7. TIE TO NEAREST LIGHTING CIRCUIT AHEAD OF SWITCH.
8. SUMP PUMP CONTROL PANEL.
9. PROVIDE POWER TO CONDENSER UNIT FROM MECHANICAL ROOM LOCATED ON FIRST FLOOR. SEE SHEET G000-84 FOR LOCATION. ROUTE POWER ABOVE CEILING TO EXTERIOR CONDENSING UNIT, WITH DISCONNECT.
10. POWER RECEPTACLE FROM MECHANICAL ROOM LOCATED ON THE FIRST FLOOR. SEE SHEET G000-84 FOR LOCATION.
11. POWER CONDENSATE PUMP RECEPTACLE FROM SAME CIRCUIT AS RECEPTACLE FROM NOTE 10.

KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:
ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:
WEST VIRGINIA
GENERAL SERVICES
DIVISION

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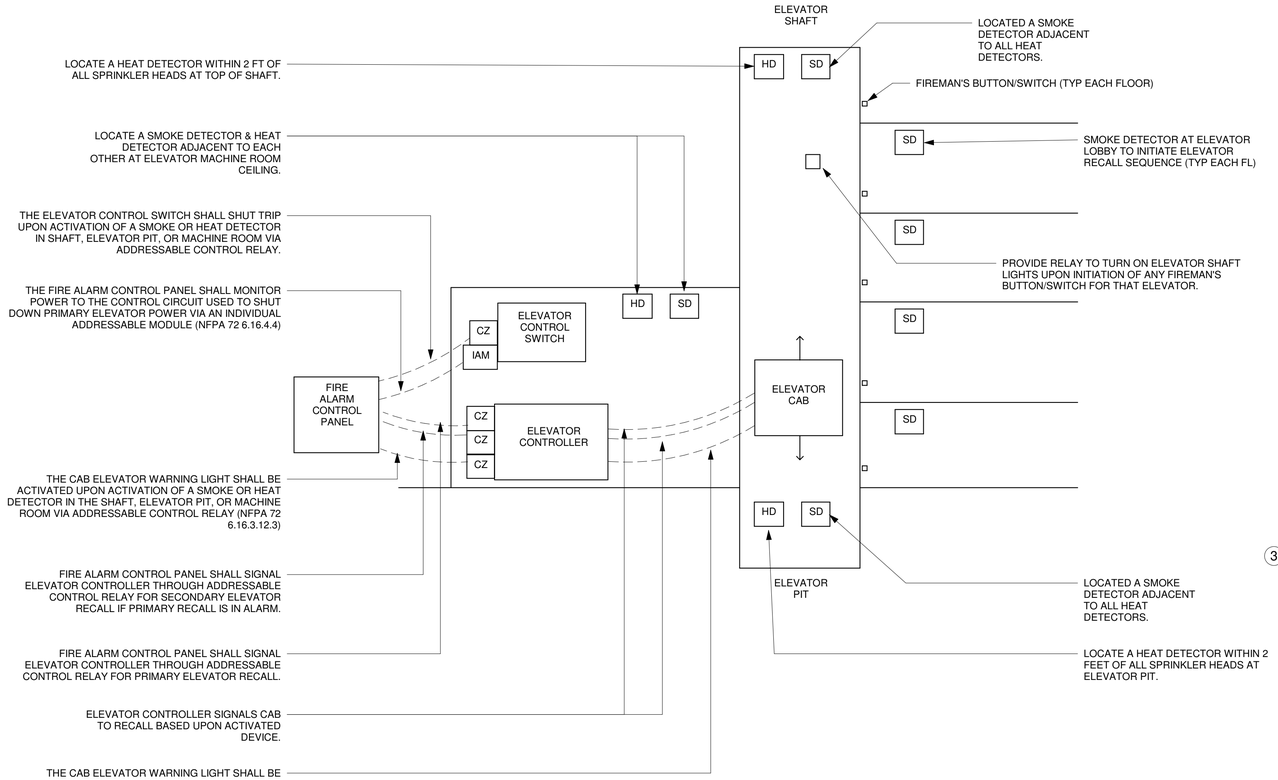
BUILDING #84 -
DEMOLITION & NEW
ELECTRICAL PLANS

E101-84

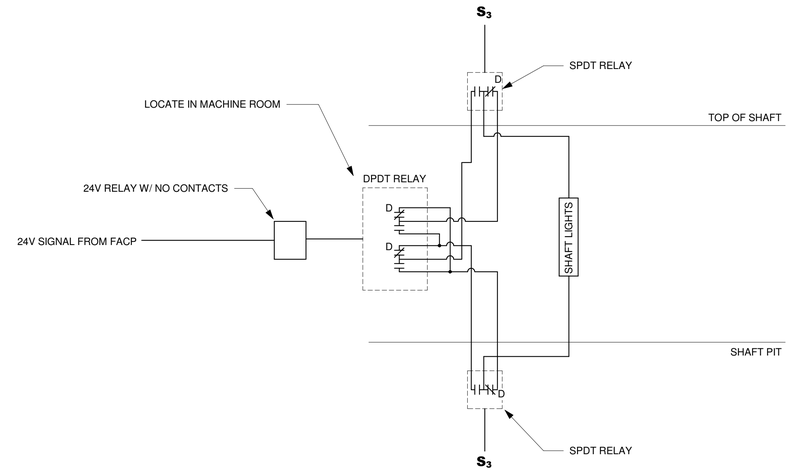


GENERAL NOTES:

1. SMOKE DETECTOR & HEAT DETECTOR TO BE PART OF THE BUILDING'S ADDRESSABLE FIRE ALARM SYSTEM.
2. ALL HEAT DETECTORS TO BE 135 DEGREE TYPE.
3. HEAT DETECTORS (135 DEGREE) SIGNAL THE FIRE ALARM CONTROL PANEL BEFORE ADJACENT SPRINKLER HEAD (165 DEGREE) IS ACTIVATED & FIRE ALARM PANEL SHUT TRIPS ELEVATOR POWER DISCONNECT TO AFFECTED ELEVATOR. SIGNALING OF SHUNT TRIP SHALL BE BY FIRE ALARM CONTROL PANEL THROUGH ADDRESSABLE CONTROL RELAY.
4. CONTROL RELAYS SHALL BE WITHIN 5 FT OF ELEVATOR CONTROLLER.
5. ALL FIRE ALARM CABLING TO ELEVATOR CONTROLLER SHALL BE SUPERVISED.
6. ESTABLISH THE PRIMARY & SECONDARY RECALL IN ACCORDANCE w/ CODE & APPROVED BY THE A.H.J.

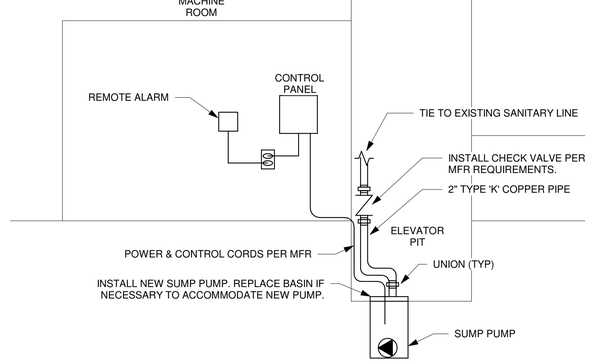
1 ELEVATOR SIGNAL CONTROL DETAIL

DRAWING NOT SCALABLE



3 SHAFT LIGHTING FIRE ALARM INTERFACE DETAIL

DRAWING NOT SCALABLE



4 SUMP PUMP ELECTRICAL DETAIL

DRAWING NOT SCALABLE

DISCONNECT SWITCH SCHEDULE

TAG	SERVES	POLES	VOLTAGE	DEVICE RATING	FUSE	ENCLOSURE	DESCRIPTION
SW1-84	ELEVATOR CAR	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SIWITCH
SW2-84	CU-1	2	240 V	30 A	20 A	TYPE3R	FUSIBLE DISCONNECT SIWITCH

ENCLOSED BREAKER SCHEDULE

TAG	SERVES	POLES	TRIP	VOLTAGE	ENCLOSURE	DESCRIPTION
EB1-84	ELEVATOR CONTROLLER	3	100 A	480 V	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY

LIGHT FIXTURE SCHEDULE

TAG	MFR	MODEL	LUMENS	COLOR TEMP.	VOLTS	WATTS	COMMENTS
F1	LUMINAIRE LED	ESF18-NODIM-50W-40K-MVOLT-CLP-GRY-EMB310-WL-NOOCC	5,280 lm	4,000 K	120-277	50 W	WALL MOUNTED VANDAL RESISTANT LED FIXTURE; CLEAR; PRISMATIC LENS; GRAY HOUSING; WET LOCATION; EMERGENCY BACKUP (1,200 LUMENS)

EXIT & EMERGENCY LIGHTING SCHEDULE

TAG	MFR	MODEL	DESCRIPTION
E1	LITHONIA	LHQMLEDRHOSD	COMBINATION EXIT SIGN & EMERGENCY LIGHT. WHITE THERMOPLASTIC HOUSING W/ RED LETTERING.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
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CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
JAMES T. WILLER
REGISTERED
15184
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:

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BUILDING #84 - ELECTRICAL DETAILS & SCHEDULES

E501-84

PLUMBING ABBREVIATIONS

A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABLITIES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
B	
BB	BASEBOARD
BC	BALANCING COCK
BD	BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BLR	BOILER
BLW	BELOW
BO	BLOW OFF
BTM	BOTTOM
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CDL	CONDENSATE DRAIN LINE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHKV	CHECK VALVE
CHWR	CHILLED & HOT WATER RETURN
CHWS	CHILLED & HOT WATER SUPPLY
CHWS&R	CHILLED & HOT WATER SUPPLY AND RETURN
CIRC	CIRCULATING
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
CLG	CEILING
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
C/O	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWFT	CONDENSER WATER FROM TOWER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SUPPLY AND RETURN
CWTT	CONDENSER WATER TO TOWER
D	
D	DEEP
Db	DRY BULB TEMPERATURE(ºF)
DCO	DOUBLE CLEAN OUT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM
DISCH	DISCHARGE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPT	DEW POINT TEMPERATURE(ºF)
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
E	
EA	EACH
EC	ELECTRICAL CONTRACTOR
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER(BOTTOMS FLAT)
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATUR(ºF)
F	
ºF	FAHRENHEIT
FA	FREE AREA
FB	FREE BLOW
F&T	FLOAT AND THERMOSTATIC TRAP
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FDN	FOUNDATION
FF	FOULING FACTOR
FIN	FINISHED
FLA	FULL LOAD AMPS
FLG	FLANGE
FLR	FLOOR
FNL	FUNNEL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOS&R	FUEL OIL SUPPLY AND RETURN
FOV	FUEL OIL VENT
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE/FEET
FTG	FITTING
FURN	FURNISH
FV	FACE VELOCITY
FW	FEED WATER
G	
G	GAS
GALV	GALVANIZED
GA	GAUGE, GAGE
GC	GENERAL CONTRACTOR
GCWR	GLYCOL CHILLED WATER RETURN
GCWS	GLYCOL CHILLED WATER SUPPLY
GHWR	GLYCOL HOT WATER RETURN
GHWS	GLYCOL HOT WATER SUPPLY
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAV	GRAVITY
GRV	GRAVITY ROOF VENTILATOR
GV	GATE VALVE
H	
H	HEIGHT
HB	HOSE BIBB
HC	HEATING CONTRACTOR; HANICAPPED
HD	HEAD/HUB DRAIN
HG	MERCURY
HGR	HANGER
HP	HORSEPOWER/HEAT PUMP
HORIZ	HORIZONTAL
HPD	HIGH PRESSURE DRIP
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HTR	HEATER
HUH	HORIZONTAL UNIT HEATER
HV	HIGH VELOCITY
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HWBG	HOT WATER BELOW GRADE
HWOH	HOT WATER OVER HEAD
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IN-WG	INCHES-WATER GAGE
INSUL	INSULATION
IPS	IRON PIPE SIZE
IVS	ISOLATION VALVE STATION
IW	INDIRECT WASTE
J	
JT	JOINT
K	
KS	KITCHEN SINK
L	
L	LENGTH
LAV	LAVATORY
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LOW PRESSURE
LPD	LOW PRESSURE DRIP
LPR	LOW PRESSURE RETURN
LPG	LOW PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LV	LOW VELOCITY
LVG	LEAVING
LWCO	LOW WATER CUTOFF
LWT	LEAVING WATER TEMPERATURE(ºF)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MPD	MEDIUM PRESSURE DRIP
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
MS	MINI-SPLIT SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MWT	MEAN WATER TEMPERATURE(ºF)
N	
N	NORTH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
ODS	OXYGEN DEPRIVATION SENSOR
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OFD	OVER FLOW DRAIN
OH	OVERHEAD
OPER	OPERATED
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OUT	OUTLET
OVC	OVERCURRENT
OVF	OVERFLOW
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP/PUMP
PE	PNEUMATIC - ELECTRIC
PG	PRESSURE DROP/PUMP DISCHARGE
PH	PHASE
PLBG	PLUMBING
PNL	PANEL
PR	PANEL RADIATOR
PRESS	PRESSURE
PRV	POWER ROOF VENTILATOR/PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	PRESSURE/TEMPERATURE TAP
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
RA	RELIEF/RETURN AIR
RAD	RADIATOR
RAF	RETURN AIR FIXTURES
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED/RECEIVED
REFRIG	REFRIGERANT
REG	REGISTER
REINF	REINFORCED
REQD	REQUIRED
RET	RETURN
REV	REVISION
RF	RETURN/RELIEF FAN
RH	REHEAT COIL
RHG	REFRIGERANT HOT
RL	REFRIGERANT LIQUID
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
RWC	RAIN WATER CONDUCTOR
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SDPR	SMOKE DAMPER
SENS	SENSIBLE
SEP	SEPARATOR
SF	SUPPLY FAN
SHT	SHEET
SK	SINK
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SPGR	SPECIFIC GRAVITY
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL UNIT
STAT	STATIC
STD	STANDARD
STL	STEEL
STR	STRAINER
SUP	SUPPLY
SV	SAFETY VALVE
SW	SWITCH
T	
TA	THROW AWAY
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TH	THERMOMETER
THK	THICK
TK	TANK
TMV	THRTMOSTATIC MIXING VALVE
TOT	TOTAL
TP	TRAP PRIMER/TRAP PRIMER SUPPLY
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
UC	UNDERCUT
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
V	
V	VOLTAGE/VALVE/VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VFS	VENTURI FLOW STATION
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THROUGH ROOF
W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WA	WATER HAMMER ARRESTER
Wb	WET BULB TEMPERATURE(ºF)
WC	WATER COLUMN/WATER CLOSET
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HEATER
WL	WATER LEVEL
WP	WEATHERPROOF
WT	WEIGHT
Y	
YCO	YARD CLEANOUT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PLUMBING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEMS AS INDICATED ON THE DRAWING, AS SPECIFIED, AND REQUIRED BY CODE.
2. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB w/ SPACE FOR INSULATION IF REQUIRED. PIPING IS TO BE "TOP DOWN".
3. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
5. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
6. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTIONS, NEAR THE BASE OF STACKS, EVERY 50'-0" IN HORIZONTAL RUN AND ELSEWHERE AS INDICATED.
7. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
8. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. DOMESTIC WATER PIPING IS TO BE TYPE "K" COPPER w/ SOLDERED FITTINGS EXCEPT AS INDICATED.
10. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER CURRENT I.P.C. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
11. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w/ GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING AND MAINTAIN PRESSURE TESTING DURING CONCRETE POURS.
12. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
13. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION
VARIOUS FACILITIES (PHASE 2):
B5, B15, B17, B84, & B86

PROJECT OWNER:

WEST VIRGINIA
GENERAL SERVICES
DIVISION

PROJECT STATUS:

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DOCUMENTS

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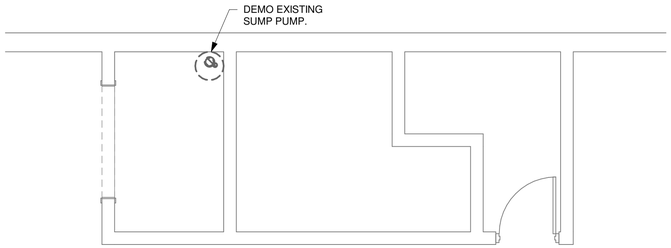
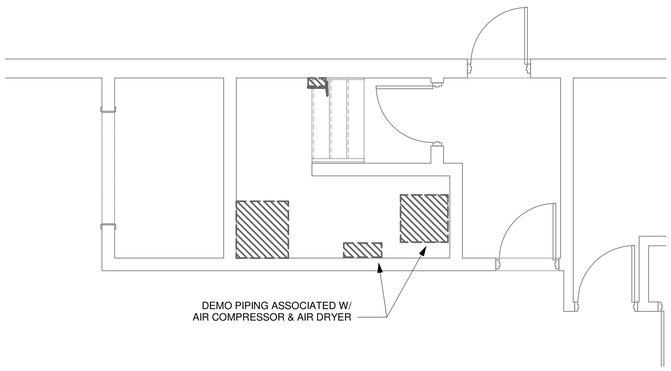
BUILDING #84 -
PLUMBING
ABBREVIATIONS

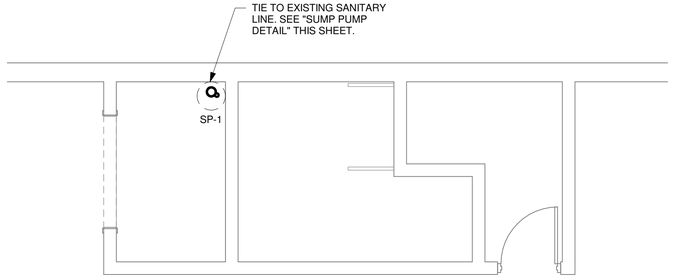
P000-84



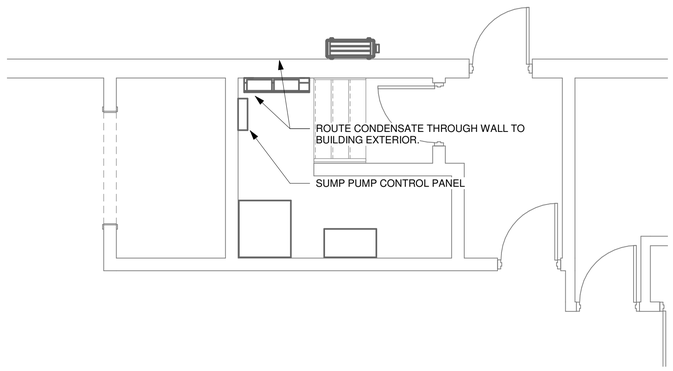
1 BASEMENT PLUMBING DEMOLITION PLAN
1/4" = 1'-0"



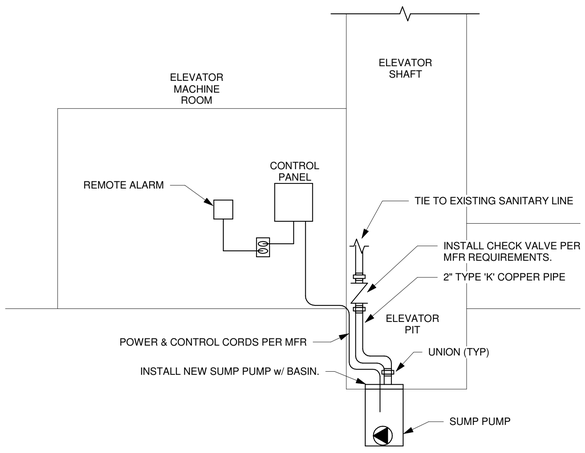
2 FIRST FLOOR PLUMBING DEMO PLAN
1/4" = 1'-0"



3 BASEMENT PLUMBING PLAN
1/4" = 1'-0"



4 FIRST FLOOR PLUMBING PLAN
1/4" = 1'-0"



5 SUMP PUMP DETAIL
3/4" = 1'-0"

SUMP PUMP SCHEDULE

MARK	SERVES	MFR	MODEL	FLOW RATE	HEAD	HP	PHASE	VOLTS	MCA	MOCP	COMMENTS
SP-1	ELEVATOR #1	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.

PLUMBING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEMS AS INDICATED ON THE DRAWING, AS SPECIFIED, AND REQUIRED BY CODE.
2. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB w/ SPACE FOR INSULATION IF REQUIRED. PIPING IS TO BE "TOP DOWN".
3. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
5. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
6. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTIONS, NEAR THE BASE OF STACKS, EVERY 50'-0" IN HORIZONTAL RUN AND ELSEWHERE AS INDICATED.
7. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
8. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. DOMESTIC WATER PIPING IS TO BE TYPE "K" COPPER w/ SOLDERED FITTINGS EXCEPT AS INDICATED.
10. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER CURRENT I.P.C. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
11. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING AND MAINTAIN PRESSURE TESTING DURING CONCRETE POURS.
12. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
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N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
JAMES M. MILLER
REGISTERED
15184
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

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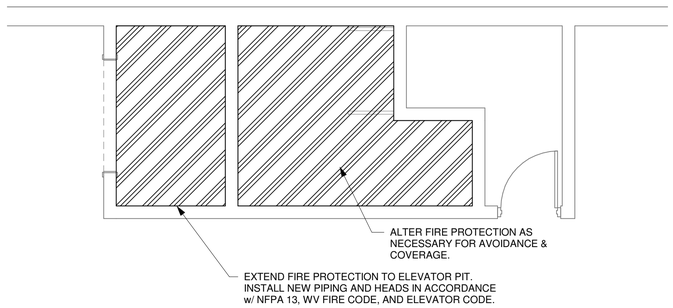
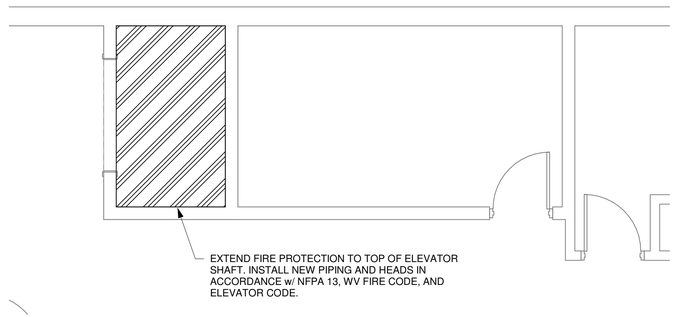
BUILDING #84 -
DEMOLITION & NEW
PLUMBING PLANS

P101-84



1 BASEMENT FIRE PROTECTION PLAN

1/4" = 1'-0"



2 SECOND FLOOR FIRE PROTECTION PLAN

1/4" = 1'-0"

FIRE PROTECTION NOTES

1. PROVIDE FIRE PROTECTION SYSTEM DESIGN AND INSTALLATION AS NECESSARY TO MEET CODES, STANDARDS, AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ) AND INSURANCE UNDERWRITERS.
2. COORDINATE ALL WORK w/ OTHER TRADES PRIOR TO THE FABRICATION OR INSTALLATION OF ANY PIPING.
3. PROVIDE SYSTEM DEVICES, PIPING, AND COMPONENTS AS NECESSARY TO INSTALL A COMPLETE FIRE PROTECTION SYSTEM. THE EXISTING SYSTEM COMPONENTS AND PIPING MAY BE REUSED w/ THE APPROVAL OF THE AHJ.
4. RETAIN THE SERVICES OF A NICET LEVEL 4 SYSTEM DESIGNER TO DESIGN AND LAYOUT THE FULL SYSTEM AS NECESSARY TO MEET THE CURRENT NFPA, STATE, AND LOCAL REQUIREMENTS. ZONE THE FIRE PROTECTION SYSTEM AS NECESSARY. PROVIDE ALL DEVICES AS REQUIRED FOR THE INSTALLATION OF A COMPLETE, TEST INSPECTED, CODE COMPLIANT SYSTEM. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ.
5. SUBMIT DETAILED FIRE PROTECTION DRAWINGS, HYDRAULIC CALCULATIONS, & ALL ITEMS STATED ON THE ICC CHECKLIST TO THE CODE REVIEW OFFICIAL. AFTER THE APPROVAL OF THE CODE REVIEW OFFICIAL, SEND THE FIRE PROTECTION DRAWINGS & HYDRAULIC CALCULATIONS TO THE ARCHITECT & ENGINEER FOR APPROVAL.
6. DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR MUST FIELD VERIFY ACTUAL CONDITIONS AT THE SITE PRIOR TO PRECEDING w/ THE WORK.
7. COORDINATE w/ LOCAL UTILITY BOARD PRIOR TO THE START OF DESIGN. COPY DESIGN BASIS FLOW TEST DATA TO THE OWNER.
8. PROVIDE DEVICES AND INTERCONNECTION TO THE FIRE ALARM SYSTEM FOR ALL ZONING, NOTIFICATION, AND ALARM AS REQUIRED. COORDINATE w/ FIRE ALARM CONTRACTOR PRIOR TO BIDDING.
9. CENTER HEADS IN CEILING TILES. VERIFY BEFORE INSTALLATION THE EXACT CEILING TYPE & PATTERN.
10. COORDINATE FINAL LOCATIONS OF SPRINKLER HEADS, PIPING, & ALL NEW WORK w/ LIGHT FIXTURES, DIFFUSERS, GRILLES, SMOKE DETECTORS, SPEAKERS, & OTHER CEILING MOUNTED DEVICES. MAKE MINOR MODIFICATIONS TO SUIT.
11. PROVIDE SLEEVES & FIRESTOP SEALANTS WHERE PIPES PENETRATE FIRE RATED FLOORS & WALLS. COMPLY w/ ASTM E-814 & UL 1479.
12. CONFORM TO ICC, FM, NFPA REQUIREMENTS AND/OR OWNER'S INSURANCE UNDERWRITER. OBTAIN PERMITS & REVIEW STAMPS FROM THE A.H.J.
13. PIPING TO BE INSTALLED ABOVE CEILING UNLESS OTHERWISE NOTED.
14. ALL CONTROL VALVES SHALL BE MONITORED.
15. THE SPRINKLER SYSTEM SHALL BE DESIGNED & SIZED BY THE SPRINKLER CONTRACTOR. THESE DOCUMENTS SHALL BE USED AS A GUIDE FOR INTENT ONLY. FAST RESPONSE SPRINKLER HEADS ARE TO BE USED WHERE POSSIBLE BY CODE. SPRINKLER CONTRACTOR SHALL INFORM & COORDINATE ALL ELECTRICAL & FIRE ALARM DEVICES w/ THE ELECTRICAL CONTRACTOR.
16. PRIOR TO BIDDING, CONTRACTOR IS TO FIELD VERIFY EXISTING FIRE PROTECTION SYSTEM & PIPING. EXISTING PIPING NEARBY MAY BE TAPPED & EXTENDED PROVIDED IT MEETS THE FLOW & PRESSURE REQUIREMENTS DETERMINED BY THE CONTRACTOR'S NICET 4 SYSTEM DESIGNER & APPROVED BY THE WVSFM'S OFFICE.
17. INSPECTOR'S TEST VALVES SHALL NOT DRAIN ONTO CONCRETE SIDEWALKS, PADS, OR CONCRETE PLAZA'S DUE TO STAINING. IF DRAINING TO GRASS AREA PROVIDE MEANS TO ELIMINATE MUD OF THEIR DEBRIS FROM SPLASHING ONTO BUILDING.

KEY PLAN

N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture

Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

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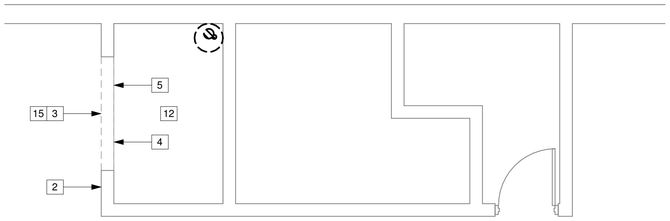
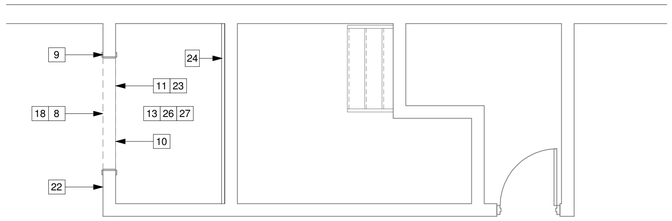
BUILDING #84 - NEW
FIRE PROTECTION
PLANS

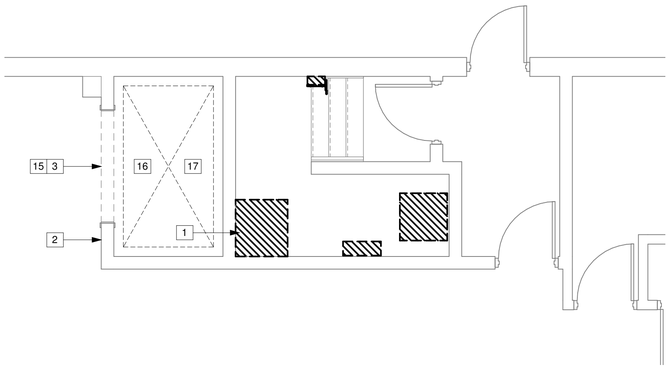
F101-84



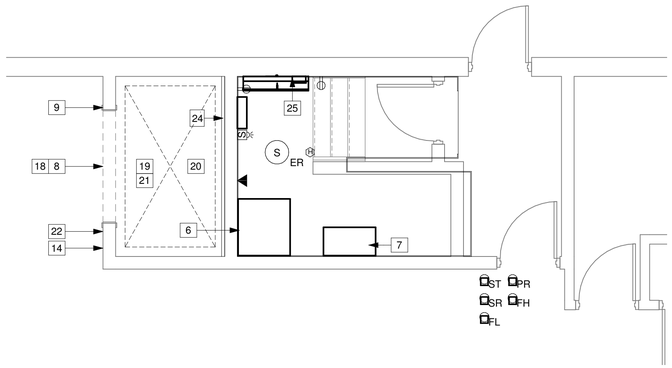
1 BASEMENT EQUIPMENT DEMOLITION PLAN
1/4" = 1'-0"



2 BASEMENT EQUIPMENT PLAN
1/4" = 1'-0"

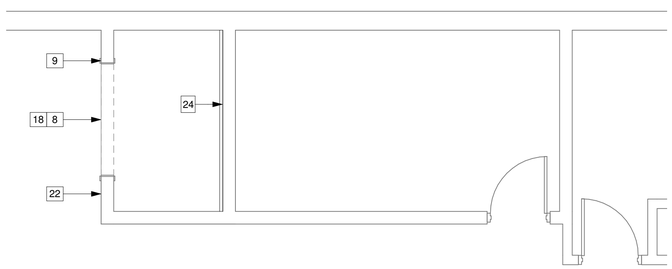


3 FIRST FLOOR EQUIPMENT DEMOLITION PLAN
1/4" = 1'-0"

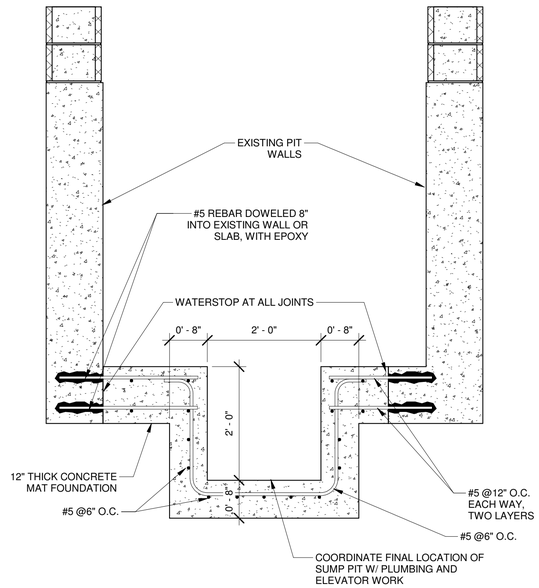


4 FIRST FLOOR EQUIPMENT PLAN
1/4" = 1'-0"

5 SECOND FLOOR EQUIPMENT DEMOLITION PLAN
1/4" = 1'-0"



6 SECOND FLOOR EQUIPMENT PLAN
1/4" = 1'-0"



7 ELEVATOR PIT DETAIL
DRAWING NOT SCALABLE

SHEET NOTES

1. DEMO ELEVATOR HYDRAULIC MACHINE, ETC. FOR COMPLETE REPLACEMENT.
2. DEMO HALL CALL.
3. DEMO FLAGS AND FLOOR INDICATOR.
4. DEMO EXISTING PIT LADDER.
5. DEMO DOOR OPERATING SYSTEM.
6. INSTALL NEW ELEVATOR CONTROLLER.
7. INSTALL NEW PUMP UNIT.
8. PROVIDE NEW FLAGS AND FLOOR INDICATOR TO FIT EXISTING ROUGH-INS WITHOUT ADAPTERS.
9. DOOR JAMBS ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, IF NEEDED. COLOR BY ARCHITECT.
10. NEW PIT LADDER w/ STOP SWITCH.
11. NEW DOOR OPERATING SYSTEM.
12. DEMO ELEVATOR BUFFERS AND CYLINDERS.
13. INSTALL NEW ELEVATOR BUFFERS AND CYLINDERS.
14. PROVIDE NEW SEPARATE FIRE MAN'S HAT.
15. DEMO HOISTWAY DOORS.
16. DEMO ELEVATOR CAR DOORS.
17. DEMO ELEVATOR CAR GUIDE RAILING.
18. INSTALL NEW HOISTWAY DOORS.
19. INSTALL NEW ELEVATOR CAR DOORS.
20. INSTALL NEW ADA COMPLIANT RAILING IN ELEVATOR CAB.
21. ELEVATOR CAR PANEL TO BE RETROFITTED OR REPLACED TO ACCOMMODATE THE ADA VIDEO PHONE.
22. PROVIDE NEW HALL CALL TO FIT ON EXISTING ROUGH-INS WITHOUT ADAPTERS.
23. PAN OFF TOE CATCH WITHIN HOISTWAY AS NECESSARY TO MEET ANSI STANDARDS.
24. PATCH ALL PENETRATIONS & GAPS IN EXISTING SHAFT WALL SYSTEM. COORDINATE W/ LIGHT CONDUIT RELOCATION.
25. ADD TWO LAYERS OF 5/8" GYP BOARD OVER 3 5/8" STEEL STUD IN EQUIPMENT ROOM.
26. APPLY XYPEX CONCENTRATE (OR SIMILAR) BASE COAT AND XYPEX MODIFIED (OR SIMILAR) TOP COAT ON VERTICAL AND HORIZONTAL SURFACES IN EXISTING ELEVATOR PITS BELOW THE BOTTOM FLOOR LEVEL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
27. INSTALL RETROFIT WATERSTOPS AT PATCHED CONCRETE WITHIN ELEVATOR PITS.

KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
REGISTERED 15184 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

PROJECT NAME:
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DEMOLITION & NEW
ELEVATOR
EQUIPMENT PLANS

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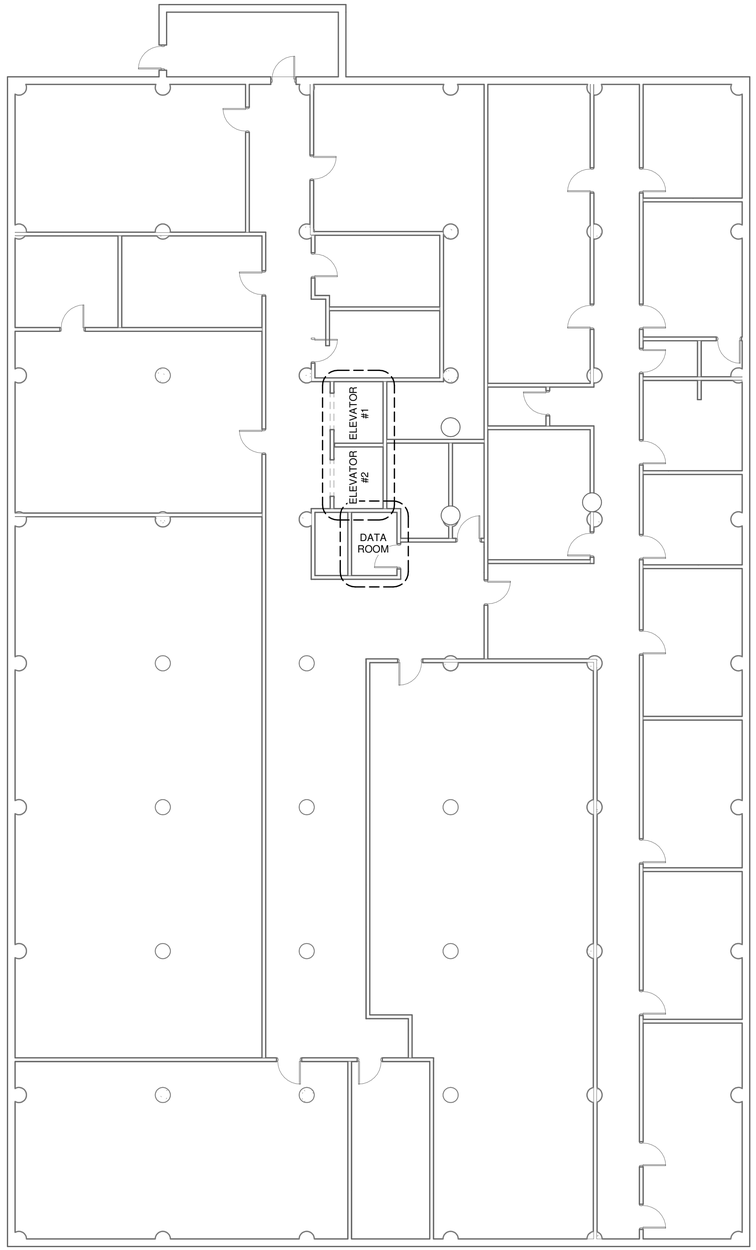
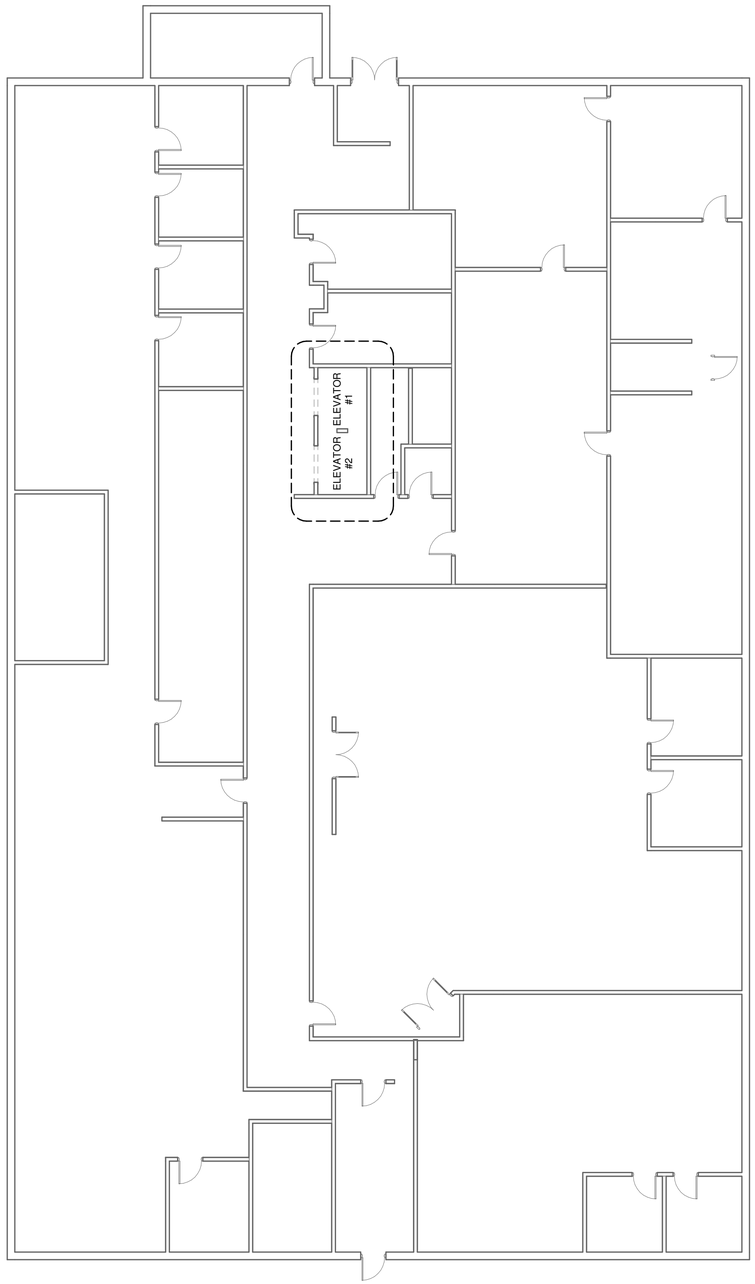
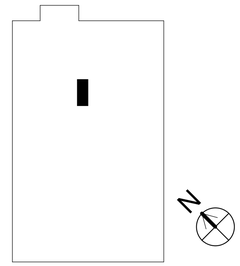


1 **REFERENCE MASTER FLOOR PLAN - BASEMENT**
1" = 10'-0"



2 **REFERENCE MASTER FLOOR PLAN - FIRST FLOOR**
1" = 10'-0"



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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
STATE OF WEST VIRGINIA
THOMAS F. PRATT
6049
REGISTERED ARCHITECT

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BUILDING #86 - GENERAL BUILDING LAYOUT

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MECHANICAL ABBREVIATIONS

SYMBOLS	
#	NUMBER
&	AND
°	DEGREES
°F	DEGREES FAHRENHEIT
A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
AUX	AUXILIARY
AVG	AVERAGE
B	
BFV	BUTTERFLY VALVE
BH	BASEBOARD HEATER
BHP	BRAKE HORESPOWER
BLR	BOILER
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CHKV	CHECK VALVE
CIRC	CIRCULATING
CI	CAST IRON
CKT	CIRCUIT
CMU	CONCRETE MASONARY UNIT
C/O	CLEAN OUT
CON	CONDENSATE
CONT	CONTINUATION
CT	COOLING TOWER
CU	CONDENSING UNIT
D	
DIA	DIAMETER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE(°F)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE(°F)
F	
°F	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	
GAS	NATURAL GAS
GALV	GALVANIZED
GA	GAUGE
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
H	
HCWL	HYDRONIC CHILLED WATER LOOP
HCWR	HYDRONIC CHILLED WATER RETURN
HCWS	HYDRONIC CHILLED WATER SUPPLY
HHWL	HYDRONIC HOT WATER LOOP
HHWR	HYDRONIC HOT WATER RETURN
HHWS	HYDRONIC HOT WATER SUPPLY
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
J	
JB	JUNCTION BOX
K	
KW	KILOWATT
KWH	KILOWATT HOUR
L	
LAT	LEAVING AIR TEMPERATURE(°F)
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LIQUID PROPANE
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE(°F)
M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MS	MINI-SPLIT SYSTEM
N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
Q	
QTY	QUANTITY
R	
RA	RETURN AIR
RAD	RADIATOR
RCP	RADIANT CEILING PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
S	
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SMOKE DAMPER
SENS	SENSIBLE
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T	
T	THERMOSTATE
TA	TRANSFER AIR
TCV	TEMPERATURE CONTROL VALVE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TSTAT	THERMOSTAT
TV	TURNING VANES
TYP	TYPICAL
U	
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	
VOLTS	VOLTAGE
VA	VOLT AMPERES
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VOLTS	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VVT	VARIABLE VOLUME AND TEMPERATURE
W	
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
WT	WEIGHT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, SPECIFICATIONS, AND REQUIRED BY CODE.
2. PROVIDE BALL VALVE STOPS AT ALL FIXTURES. PROVIDE UNIONS, DIRT LEGS, AND REGULATORS ON ALL EQUIPMENT.
3. COORDINATE ALL STUB-UPS AND FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS.
4. PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN THE HEATING WATER, CHILLED WATER, AND OTHER CLOSED WATER PIPING SYSTEMS. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT BOTTOM OF RISERS AND LOW POINTS.
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6. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, ETC. ARE ACCESSIBLE.
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MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

BRIAN C. MILLER
REGISTERED
5184
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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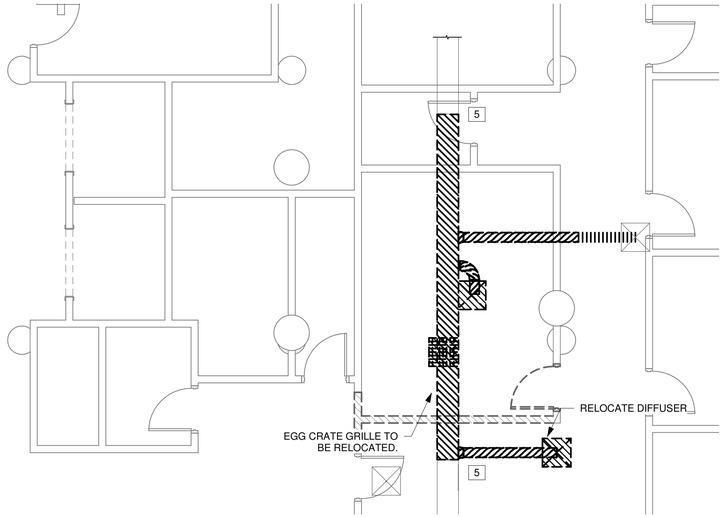
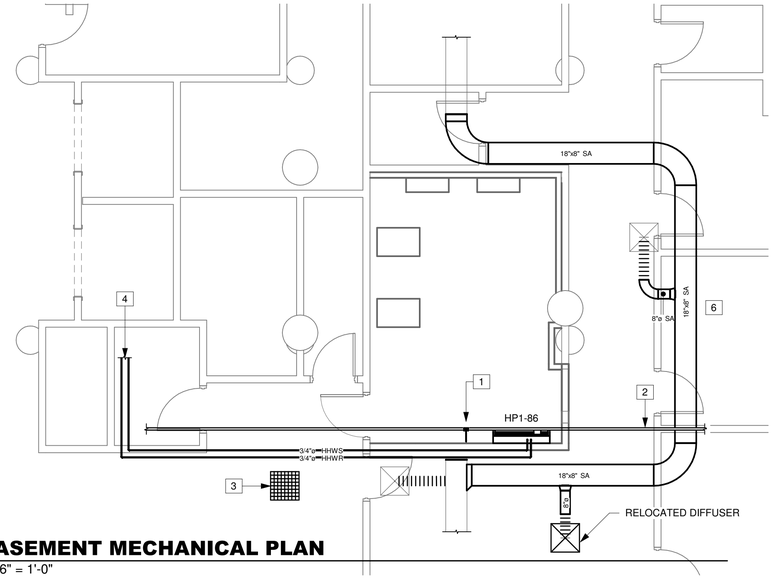
BUILDING #86 - MECHANICAL ABBREVIATIONS

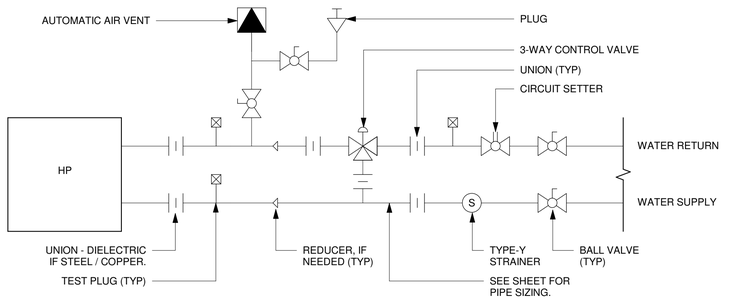
M000-86



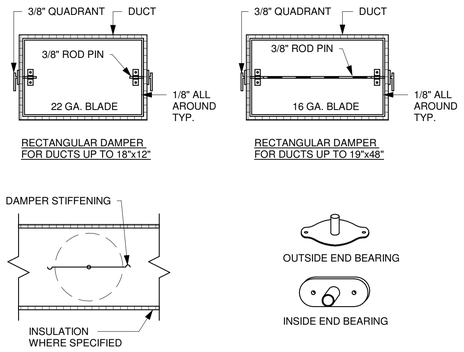
1 BASEMENT MECHANICAL DEMOLITION PLAN
3/16" = 1'-0"



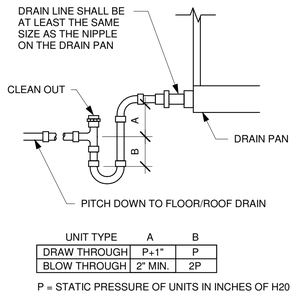
2 BASEMENT MECHANICAL PLAN
3/16" = 1'-0"



3 2-PIPE COIL CONNECTION DETAIL
DRAWING NOT SCALABLE



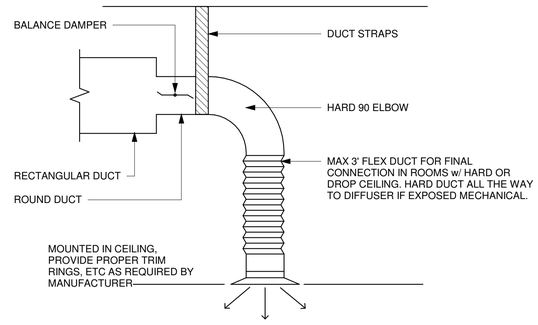
4 BALANCE DAMPER DETAIL
DRAWING NOT SCALABLE



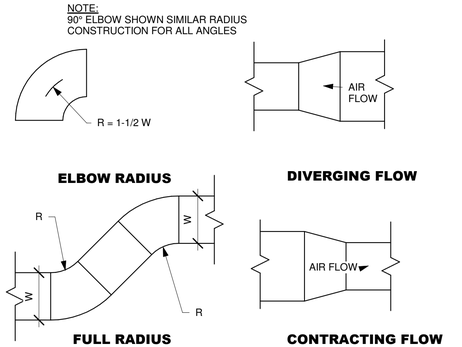
UNIT TYPE	A	B
DRAW THROUGH	P+1"	P
BLOW THROUGH	2" MIN.	2P

P = STATIC PRESSURE OF UNITS IN INCHES OF H20

5 CONDENSATE DRAIN DETAIL
DRAWING NOT SCALABLE



6 DIFFUSER CONNECTION DETAIL
DRAWING NOT SCALABLE



7 DUCT TRANSITION DETAIL
DRAWING NOT SCALABLE

WATER SOURCE HEAT PUMP SCHEDULE

MARK	MFR.	MODEL	AIR FLOW	FLUID TYPE	FLUID FLOW	COOLING INFORMATION								HEATING INFORMATION					ELECTRICAL INFORMATION				NOTES
						COOLING LOADS		ENTERING		LEAVING		WATER TEMPERATURE		HEATING LOAD	AIR TEMPERATURE		WATER TEMPERATURE		VOLT	PHASE	MCA	MOCP	
						SENS	TOTAL	DB	WB	DB	WB	ENTER	LEAVE		ENTER	LEAVE	ENTER	LEAVE					
HP1-86	CARRIER	50PEC-018	520 CFM	WATER	4.5 GPM	12,700 Btu/h	16,500 Btu/h	80.0 °F	67.0 °F	57.5 °F	56.7 °F	85.0 °F	94.2 °F	22,900 Btu/h	68.0 °F	108.8 °F	70.0 °F	62.3 °F	230 V	1	10.0 A	15 A	PROVIDE w/ DISCONNECT; FLOOR MOUNTED UNIT

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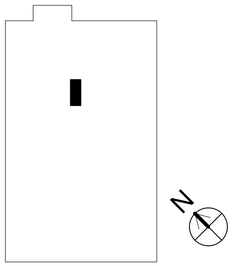
SHEET NOTES

1. PROVIDE LITTLE GIANT - VCL-45ULS (OR APPROVED EQUAL) TO PUMP CONDENSATE TO EXISTING PVC CONDENSATE LINE LOCATED IN THE CORRIDOR. CONDENSATE PIPING TO BE 3/8" TYPE "K" COPPER, NO VINYL TUBING.
2. REMOVE INSULATION ON CONDENSATE AS NECESSARY TO ALLOW DUCTWORK TO PASS.
3. RELOCATED EGG CRATE GRILLE.
4. TIE NEW HYDRONIC PIPING TO EXISTING HYDRONIC MAIN. FOLLOW EXISTING HEAT PUMP PIPING TO LOCATION. TEEING PIPING OFF OF BRANCH PIPING IS NOT ACCEPTABLE, MUST BE FROM MAIN PIPING.
5. DEMO FOR RECONNECTION.
6. ROUTE ABOVE CEILING TILE, FINAL LOCATION IN FIELD.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
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CARMICHAELS, PA 15320
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BUILDING #86 - DEMOLITION AND NEW MECHANICAL PLAN

M101-86

ELECTRICAL ABBREVIATIONS

1P	SINGLE POLE
1PH	SINGLE-PHASE
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3WAY	THREE-WAY
4/C	FOUR-WIRE
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4WAY	FOUR-WAY
4W	FOUR-WIRE
ø	PHASE
A	
A	AMPERE
AC	ALTERNATING CURRENT; ARMORED CABLE
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
A/E	ARCHITECT/ENGINEER
AFC	ABOVE FINISHED COUNTER
AFCI	ARC FAULT CIRCUIT INTERUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANN	ANNUNCIATOR
APPD	APPROVED
APPROX	APPROXIMATELY; APPROXIMATE
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING; AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
ATTN	ATTENTION
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AVG	AVERAGE
AWG	AMERICAN WRE GAUGE
B	
BAS	BUILDING AUTOMATION SYSTEM
BAT	BATTERY
BFF	BELOW FINISHED FLOOR
BG	BELOW GRADE
BKBD	BACKBOARD
BLDG	BUILDING
BLT	BUILT
BLW	BELOW
BOT	BOTTOM
BPS	BOLTED PRESSURE SWITCH
BRKR	BREAKER
BSMT	BASEMENT
BTWN	BETWEEN
BX	INTERLOCKED ARMORED CABLE
BYP	BYPASS
C	
C	CELSIUS
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION SYSTEM
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CD	CANDELA; CONSTRUCTION DOCUMENTS;
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CIR	CIRCLE
CKT	CIRCUIT
C	CENTERLINE
CL	CURRENT LIMITING; CENTER LINE; CLASS; CLOSE
CLG	CEILING
CLR	CLEAR
CND	CONDUIT
COAX	COAXIAL
COL	COLUMN
COMB	COMBINATION; COMBINED
COMM	COMMUNICATION
COMPR	COMPRESSOR
CONC	CONCRETE
CONN	CONNECT
CORR	CORRIDOR; CORRECT
CP	CONTROL PANEL
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CTR	CENTER
CTRL	CONTROL
CU	COPPER; COEFFICIENT OF UTILIZATION; CUBIC
CU FT	CUBIC FEET
CUR	CURRENT
D	
D	DEPTH
DB	DIRECT BURIAL / DECIBEL
DBL	DOUBLE
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DEL	DELETE; DELIVER
DEMO	DEMOLITION; DEMONSTRATION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM; DIAGONAL
DIFF	DIFFERENCE
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE; DISTRICT
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION; DIVIDE
DN	DOWN
DOC	DOCUMENT
DPDT	DOUBLE POLE; DOUBLE THROW
DPST	DOUBLE POLE; SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING
E	
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
ELR	END OF LINE RESISTOR
EM	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENGR	ENGINEER
ENGY	ENERGY
ENT	ELECTRICAL NONMETALLIC TUBING
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EST	ESTIMATE
ESTB	ESTABLISH
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION; EXPOSED; EXPAND
EXT	EXTERIOR; EXTERNAL
EXTN	EXTENSION
F	
F	FAHRENHEIT; FEMALE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FOOT-CANDLE
FCU	FAN COIL UNIT
FDR	FEEDER
FIN	FINISH
FIN GR	FINISH GRADE
FIXT	FIXTURE
FL MT	FLUSH MOUNT
FLEX	FLEXIBLE
FLG	FLOORING
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FREQUENCY MODULATION
FP	FIREPROOF
FR	FIRE RESISTANT
FREQ	FREQUENCY
FS	FUSIBLE SWITCH; FLOW SWITCH
FSC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET; FIRE TREATED; FOOT
FU	FUSE
FU SW	FUSED SWITCH
FURN	FURNISH; FURNACE; FURNITURE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL; GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GOVT	GOVERNMENT
GRN	GROUND
GYP	GYPSUM
H	
HDW	HARDWARE
HF	HIGH FREQUENCY
HID	HIGH INTENSITY DISCHARGE
HO	HOLD OPEN
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HP	HORSEPOWER; HEAT PUMP; HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ; FREQUENCY IN CYCLES PER SECOND
I	
ID	INSIDE DIAMTER; INSIDE DIMENSION; IDENTIFICATION
ILLUM	ILLUMINATION
IMC	INTERMEDIATE METAL CONDUIT
INFO	INFORMATION
INSUL	INSULATION
INTERCOM	INTERCOMMUNICATION
INTL	INTERNATIONAL
IR	INFRARED; INSIDE RADIUS
IT	INFORMATION TECHNOLOGY
J	
JB	JUNCTION BOX
K	
KCMIL	THOUSAND CIRCULAR MILS
KHz	KILOHERTZ
KIT	KITCHEN
KO	KNOCKOUT
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kVAh	KILOVOLT AMPERE PER HOUR
kVAR	KILOVAR; KILOVOLT AMPERE REACTIVE
kW	KILOWAT
kWh	KILOWATT HOURS
L	
L	LITER; ANGLE
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LIN	LINEAR
LM	LUMEN
LOC	LOCATION
LP	LIGHT POLE; LOW PRESSURE
LPW	LUMENS PER WATT
LT	LIGHT
LT SW	LIGHT SWITCH
LTD	LIMITED
LTG	LIGHTING
LV	LOW VOLTAGE
M	
M	METER
mA	MILLIAMPERE
MACH	MACHINE
MAG	MAGNET
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMIM
MC	MECHANICAL CONTRACTOR; METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
ME	MECHANICAL ENGINEER
MECH	MECHANICAL
MED	MEDICAL; MEDIUM
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MH	MANHOLE; METAL HALIDE
MHZ	MEGAHERTZ
MI	MINERAL INSULATED
MIC	MICROPHONE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOA	MULTIOUTLET ASSEMBLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MODIFY; MODULE
MON	MONITOR
MOT	MOTOR
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MEETING; MOUNTING
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MULT	MULTIPLE
mV	MILLIVOLT
MVA	MEGAVOLT-AMPERE
MW	MEGAWATT; MICROWAVE
mW	MILLIWATT
MWH	MEGAWATT HOUR
N	
N	NORTH
NC	NORMALLY CLOSED
NE	NORMAL EMERGENCY
NEC	NATIONAL ELECTRICAL CODE
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN; NUMBER
NORM	NORMAL
NTS	NOT TO SCALE
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OH	OVERHEAD
OL	OVERLOAD ELEMENT
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OVC	OVERCURRENT
P	
P	POLE (S); PILOT
PA	POWER AMPLIFIER; PUBLIC ADDRESS
PART	PARTIAL
PB	PULL BOX; PANEL BOARD; PANIC BAR; PUSH-BUTTON
PC	PLUMBING CONTRACTOR; PIECE
PE	PHOTOELECTRIC, PNEUMATIC ELECTRIC
PEN	PENETRATE
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PLBG	PLUMBING
PNL	PANEL
POS	POSITION; POSITIVE
PP	POWER POLE
PR	PAIR
PRELIM	PRELIMINARY
PREP	PREPARATION
PRESS SW	PRESSURE SWITCH
PREV	PREVIOUS
PRI	PRIMARY
PROJ	PROJECT
PS	PULL STATION
PT	POTENTIAL TRANSFORMER
PVC	POLYVINAL CHLORIDE (PLASTIC)
PWR	POWER
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QTY	QUANTITY
QUAL	QUALITY
R	
R	RELAY; RADIUS
R/W	RIGHT OF WAY
RC	REMOTE CONTROL
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RCPT	RECEPTACLE
REF	REFRIGERATOR; REFERENCE
REINF	REINFORCED
REPL	REPLACE
REQD	REQUIRED
REV	REVISION; REVOLUTIONS
RFI	REQUEST FOR INFORMATION
RFP	REQUEST FOR PROPOSAL
RH	RIGHT HAND
RHC	REHEAT COIL
ROW	RIGHT OF WAY
RS	RAPID START
RTG	RATING
RTU	ROOF TOP UNIT
S	
S/S	START / STOP
SAMP	SAMPLE
SCHED	SCHEDULE
SCHEM	SCHEMATIC
SD	SMOKE DETECTOR
SDMPR	SMOKE DAMPER
SEC	SECONDARY
SECT	SECTION
SEP	SEPARATE
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SMR	SURFACE MOUNTED RACEWAY
SNSR	SENSOR
SOLV	SOLENOID VALVE
SPDT	SINGLE POLE; DOUBLE THROW
SPEC	SPECIFICATION
SPKR	SPEAKER
SPLY	SUPPLY
SPST	SINGLE POLE; SINGLE THROW
SQ	SQUARE
SS	STAINLESS STEEL
ST	SINGLE THROW; STAIRS; STREET
ST PR	STATIC PRESSURE
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STARTER; STRAIGHT; STRIKE; STRINGERS
STRB	STROBE
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUP	SUPPLEMENTARY
SUPVR	SUPERVISOR
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH; SIDEWALK
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL
SYS	SYSTEM
T	
T&M	TIME AND MATERIAL
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRU	THROUGH
TL	TWIST LOCK
TOC	TOP OF CONCRETE; TOP OF CURB
TOL	TOLERANCE
TP	TWISTED PAIR; TELEPHONE POLE
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TV	TELEVISION
TVOUT	TELEVISION OUTLET
TYP	TYPICAL
U	
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UL	UNDER WRITERS LABORATORIES
UTP	UNSHIELDED TWITED PAIR
UTIL	UTILITY
UV	UNIT VENTILATOR; ULTRAVIOLET
V	
V	VOLT
VA	VOLT AMPERE
VAM	VOLTAMMETER
VAR	VARIATION; VARIES; VOLT AMPERE REACTIVE
VD	VOLTAGE DROP; VOLUME DAMPER
VERT	VERTICAL
VF	VARIABLE FREQUENCY
VFD	VARIABLE FREQUENCY DRIVE
VID	VIDEO
VIF	VERIFY IN FIELD
VOLT	VOLTAGE
VR	VOLTAGE REGULATOR; VAPOR RETARDED
VRFY	VERIFY
VRLY	VOLTAGE RELAY
VS	VOLTMETER SWITCH; VENT STACK
W	
W	WIRE; WATT; WASTE; WEST; WIDE
W/	WITH
W/O	WITHOUT
WHM	WATTHOUR METER
WP	WEATHERPROOF; WATER PUMP; WATER HEATER
WR	WEATHER RESISTANT; WATER REPELLENT
WW	WIREWAY; WARM WHITE; WASTE WATER
X	
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATITLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. GROUP AND TRAIN ALL TEL/DATA CABLE. SUPPORT FROM STRUCTURE.
10. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
11. PERFORM ALL WORK IN ACCORDANCE WITH 2017 NEC.
12. COORDINATE FINAL FIXTURE LOCATIONS WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION OF CEILING. FINAL COORDINATION OF SCOPE OF WORK , DIMENSIONS, FIXTURE PLACEMENT, ROUTINGS, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING.

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

ELECTRICAL LEGEND

WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
	120V GFCI DUPLEX RECPTACLE

LIGHTING LEGEND

$	SINGLE POLE SWITCH
$3	3-WAY POLE SWITCH

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

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CHECKED BY:	BCM

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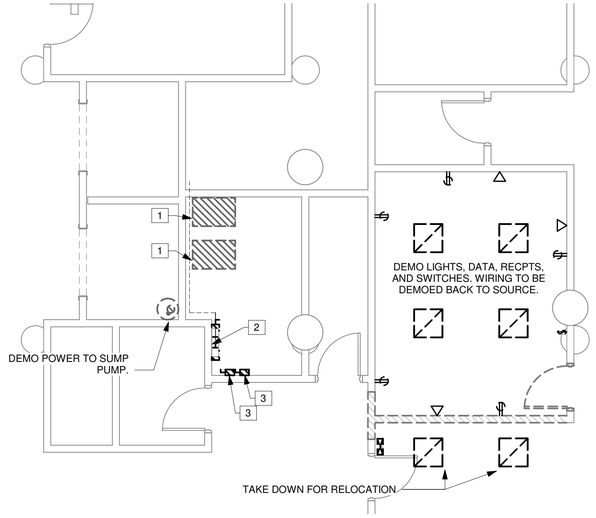
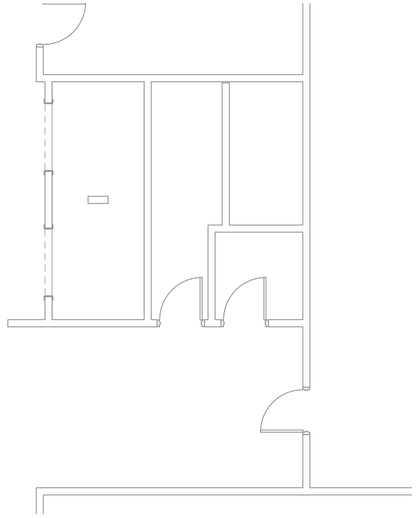
BUILDING #86 - ELECTRICAL ABBREVIATIONS

E000-86



1 BASEMENT ELECTRICAL DEMO. PLAN
3/16" = 1'-0"



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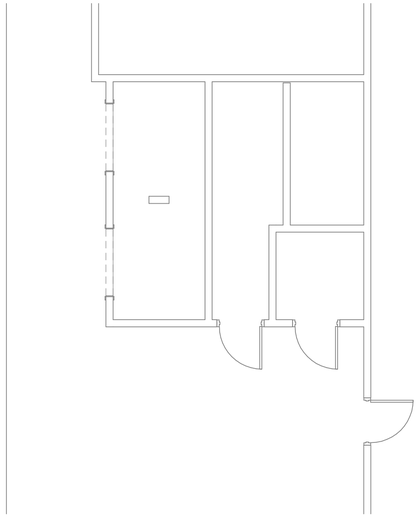
3/16" = 1'-0"



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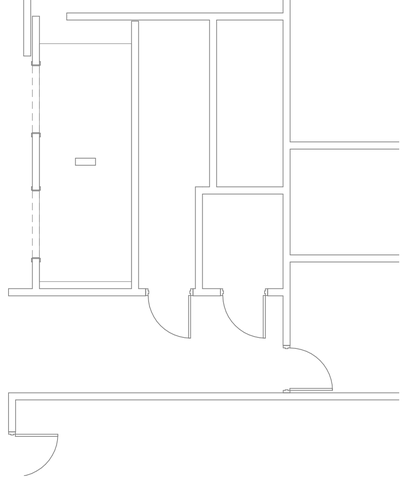
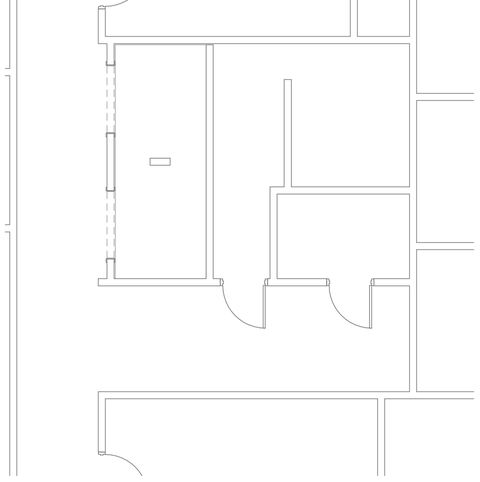
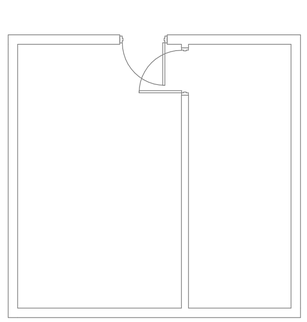
3/16" = 1'-0"



4 THIRD FLOOR ELECTRICAL DEMO. PLAN
3/16" = 1'-0"



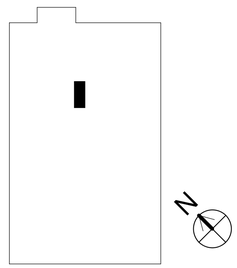
5 FOURTH FLOOR ELECTRICAL DEMO. PLAN
3/16" = 1'-0"



6 ROOF ELECTRICAL DEMO. PLAN
3/16" = 1'-0"

SHEET NOTES

1. DEMO POWER TO ELEVATOR CONTROLLER & PUMP UNITS.
2. DEMO EXISTING ELEVATOR POWER DISCONNECTS & TAP FEEDS IN WIREWAY BELOW. MAKE SAFE 200A FEEDER WIRE IN WIREWAY FOR FUTURE EXTENSION TO NEW PANEL.
3. DEMO ELEVATOR CAR DISCONNECT SWITCH. INSTALL JUNCTION BOX & MAKE SAFE LINE SIDE WIRING FOR FUTURE EXTENSION TO NEW ELEVATOR POWER.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
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304-276-7151
www.montumarch.com

SEAL:
BRIAN C. MILLER
REGISTERED
15184
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

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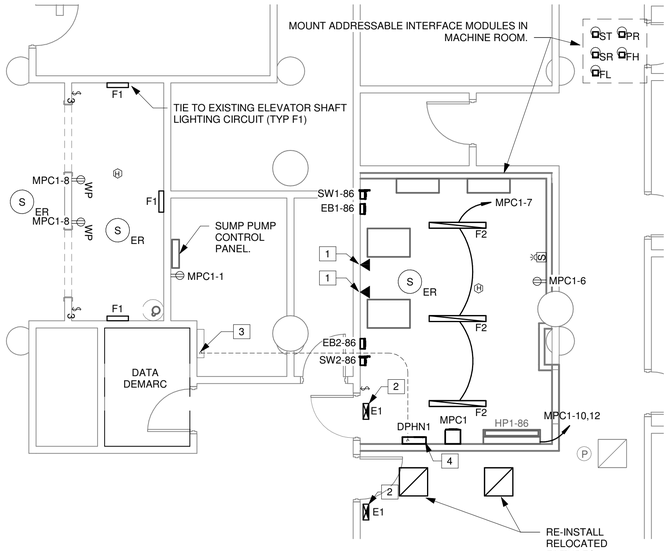
BUILDING #86 - ELECTRICAL DEMOLITION PLANS

E001-86



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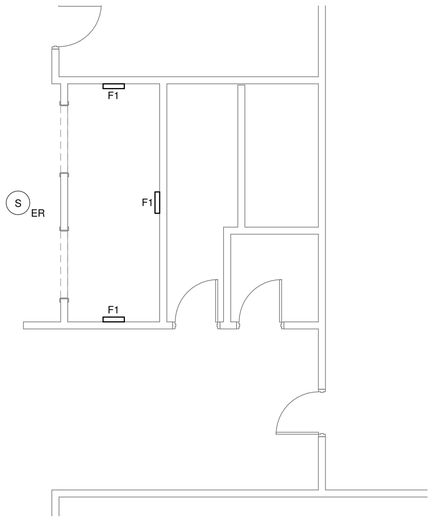
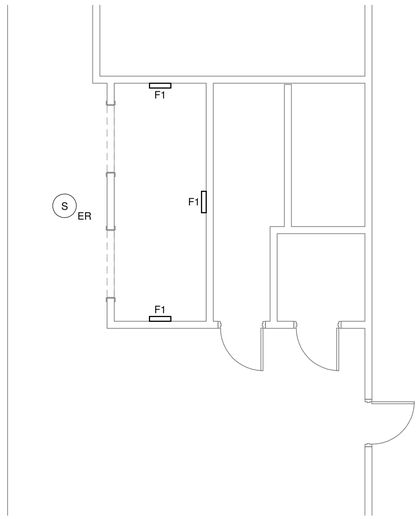
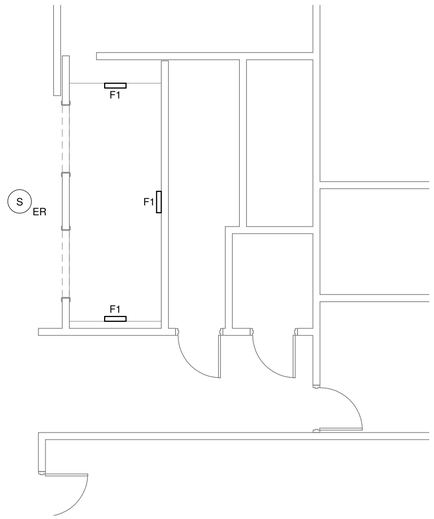


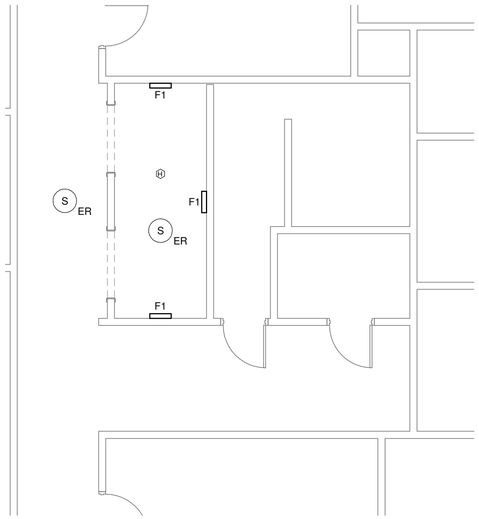
2 FIRST FLOOR ELECTRICAL PLAN
3/16" = 1'-0"



3 SECOND FLOOR ELECTRICAL PLAN
3/16" = 1'-0"



4 THIRD FLOOR ELECTRICAL PLAN
3/16" = 1'-0"



5 FOURTH FLOOR ELECTRICAL PLAN
3/16" = 1'-0"

FIRE ALARM NOTES

1. PROVIDE FIRE ALARM WIRING AND CONDUIT AS NECESSARY TO MEET CODES, STANDARDS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. PROVIDE WIRING AND CONDUIT AS NECESSARY TO INSTALL ALL FIRE ALARM DEVICES AND PANELS FOR A COMPLETE SYSTEM.
3. RETAIN THE SERVICES OF A NICET LEVEL 3 OR 4 SYSTEM DESIGNER TO DESIGN A COMPLETE FIRE ALARM SYSTEM AS NECESSARY TO MEET CURRENT NFPA, STATE AND LOCAL REQUIREMENTS.
4. PROJECT DRAWINGS ARE DIAGRAMMATIC IN NATURE. PROVIDE HORN/STROBES AS SHOWN AND SUPPLEMENT AS NECESSARY TO MEET REQUIREMENTS OF CURRENT NFPA, STATE AND LOCAL REQUIREMENTS. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ AND INSURANCE UNDERWRITERS.
5. PROVIDE DUCT DETECTORS IN ACCORDANCE w/ NFPA STANDARDS FOR ALL AIR SYSTEMS OF 2,000 - 15,000 CFM. DETECTORS TO BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRE/CONNECTER BY FIRE ALARM CONTRACTOR AS PART OF FIRE ALARM INSTALLATION.
6. FIRE ALARM WIRING IS TO BE IN CONDUIT OR MC CABLE APPROPRIATELY LABELED AS REQUIRED BY CURRENT NFPA 72.
7. PERFORM ALL WORK IN ACCORDANCE w/ CURRENT NFPA 72 AND 2017 NEC.
8. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION.

SHEET NOTES

1. ROUTE (2) CAT6a CABLES FROM DEMARC LOCATION TO DATA DROP LOCATION & TERMINATE W/ RJ45 JACK. SEE SHEET G000-86 FOR ROOM LOCATION.
2. TIE TO NEAREST LIGHT CIRCUIT AHEAD OF SWITCH.
3. SPLICE EXISTING 200A FEED & EXTEND TO NEW PANEL DPHN1. INSTALL 2" CONDUIT. INFILL ANY UNUSED OPENINGS IN WIREWAY.
4. PROVIDE DIGITAL TRIP MAIN BREAKER ON DPHN1. PERFORM SELECTIVE COORDINATION TO PREVENT EITHER ELEVATOR #1 OR ELEVATOR #2 FROM TRIPPING DPHN1 MAIN BREAKER.

ELECTRICAL NOTES

1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. ALL WALL MOUNTED DEVICES ARE FINAL HEIGHT BY. ARCH.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED FOR ALL OUTLETS AND DEVICES. FOLLOW INDICATED CIRCUITS NUMBERS AND PANEL DESIGNATION. OBTAIN PRIOR APPROVAL OF ENGINEER FOR DEVIATIONS.
3. ALL 15A AND 20A, 115V AND 120V RECEPTACLES LOCATED IN DWELLING UNITS SHALL BE TAMPER RESISTANT.
4. ALTHOUGH ALL BRANCH CIRCUIT WIRING IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED. ALL NEUTRALS SHALL BE FULL CAPACITY. THE USE OF SHARED OR COMMON NEUTRALS IS PROHIBITED ON ALL ELECTRIC WIRING.
5. PROVIDE CONTROL AND FIRE ALARM WIRE AS NECESSARY TO INSTALL ALL SYSTEMS DEVICES AND PANELS FOR COMPLETE SYSTEMS. FINAL CONNECTION TO PERMANENTLY MOUNTED EQUIPMENT IS PART OF THE ELECTRICAL SCOPE OF THIS PROJECT.
6. PROVIDE TEL/DATA AND CAT6a AS INDICATED. REVIEW DATA, SWITCH, RECEPTACLE, ETC LOCATIONS AND HEIGHTS WITH OWNER PRIOR TO INSTALLATION.
7. ALL INTERIOR WIRING SHALL BE THHN/THWN IN METAL CONDUIT OR MC CABLE. MAX OF 3'-0" OF FLEXIBLE CONDUIT MAY BE USED FOR FINAL EQUIPMENT TERMINATIONS.
8. EXTERIOR WIRING IS TO BE THHN/THWN IN PVC CONDUIT. MAX. OF 3'-0" OF FLEXIBLE METALLIC SEATTLE CONDUIT MAY BE USED TO EXTERIOR EQUIPMENT.
9. GROUP AND TRAIN ALL TEL/DATA CABLE. SUPPORT FROM STRUCTURE.
10. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK WITH OTHER TRADES. COORDINATE ALL CEILING MOUNTED DEVICES WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
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ELECTRICAL LEGEND

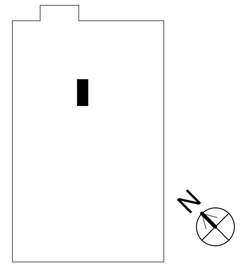
WP	120V GFCI DUPLEX RECPTACLE, WEATHER PROOF
	120V GFCI DUPLEX RECPTACLE

FIRE ALARM LEGEND

M	MANUAL PULL STATION
S	SMOKE DETECTOR
S ER	SMOKE DETECTOR - ELEVATOR RECALL
H	HEAT DETECTOR
F	HORN / STROBE
S	STROBE LIGHT
ST	ADDRESSABLE MODULE - ELEVATOR POWER SHUNT TRIP
PR	ADDRESSABLE MODULE - PRIMARY RECALL
SR	ADDRESSABLE MODULE - SECONDARY RECALL
FH	ADDRESSABLE MODULE - FIREMAN'S HAT
FH	ADDRESSABLE MODULE - FLASHING HAT

LIGHTING LEGEND

$	SINGLE POLE SWITCH
$3	3-WAY POLE SWITCH



KEY PLAN
N.T.S.

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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
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Montum Architecture
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Keyser, WV 26726
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www.montumarch.com

SEAL:
BRIAN C. MILLER
REGISTERED
15184
STATE OF
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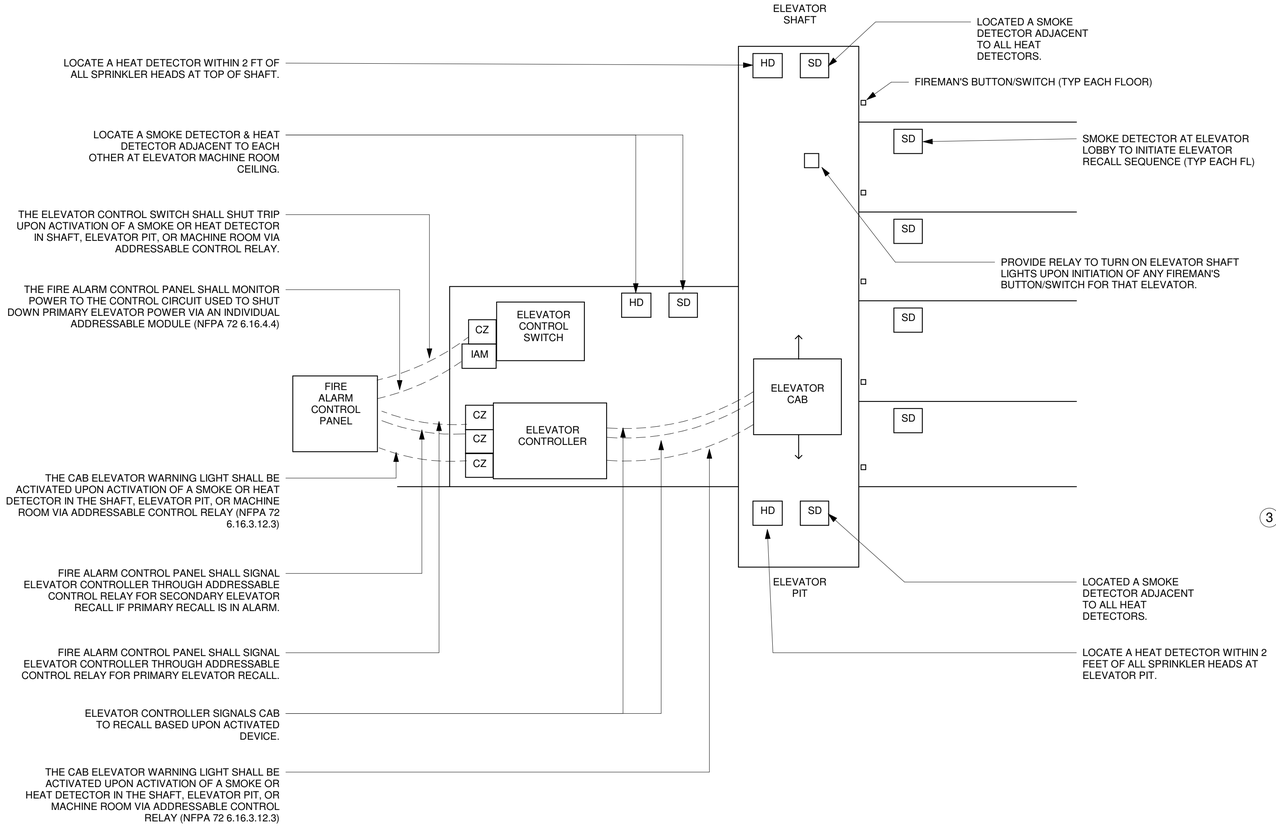
E101-86

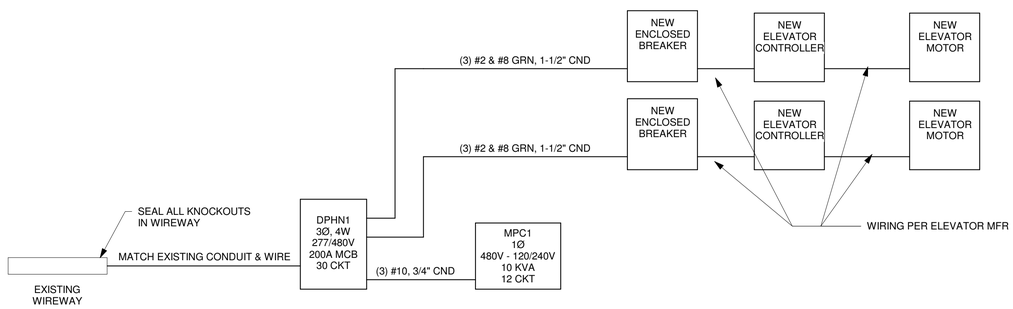


GENERAL NOTES:

1. SMOKE DETECTOR & HEAT DETECTOR TO BE PART OF THE BUILDING'S ADDRESSABLE FIRE ALARM SYSTEM.
2. ALL HEAT DETECTORS TO BE 135 DEGREE TYPE.
3. HEAT DETECTORS (135 DEGREE) SIGNAL THE FIRE ALARM CONTROL PANEL BEFORE ADJACENT SPRINKLER HEAD (165 DEGREE) IS ACTIVATED & FIRE ALARM PANEL SHUT TRIPS ELEVATOR POWER DISCONNECT TO AFFECTED ELEVATOR. SIGNALING OF SHUNT TRIP SHALL BE BY FIRE ALARM CONTROL PANEL THROUGH ADDRESSABLE CONTROL RELAY.
4. CONTROL RELAYS SHALL BE WITHIN 5 FT OF ELEVATOR CONTROLLER.
5. ALL FIRE ALARM CABLING TO ELEVATOR CONTROLLER SHALL BE SUPERVISED.
6. ESTABLISH THE PRIMARY & SECONDARY RECALL IN ACCORDANCE w/ CODE & APPROVED BY THE A.H.J.

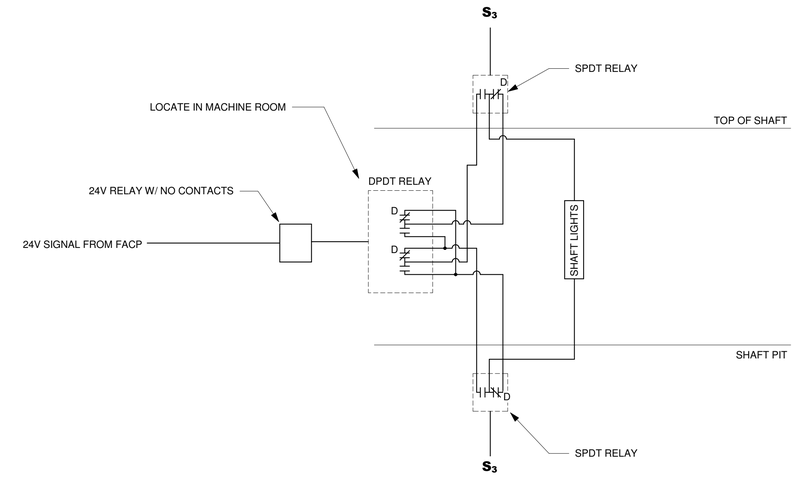
1 ELEVATOR SIGNAL CONTROL DETAIL

DRAWING NOT SCALABLE



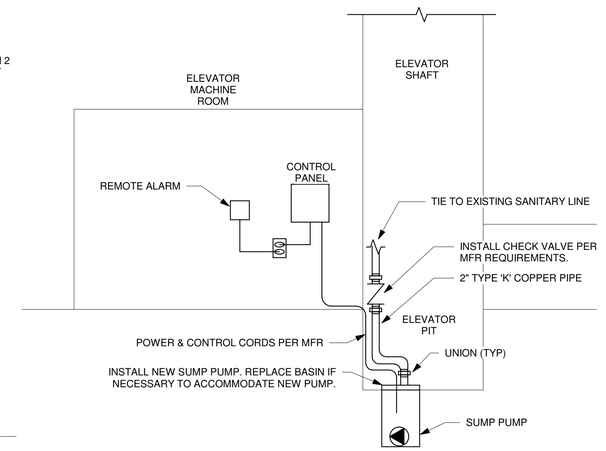
2 ELEVATOR POWER ONE-LINE

DRAWING NOT SCALABLE



3 SHAFT LIGHTING FIRE ALARM INTERFACE DETAIL

DRAWING NOT SCALABLE



4 SUMP PUMP ELECTRICAL DETAIL

DRAWING NOT SCALABLE

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:

Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

CONSTRUCTION DOCUMENTS

NO.	DESCRIPTION	DATE

PROJECT NUMBER:	19006
ORIGINAL PAGE SIZE:	22x34
DESIGNED BY:	BCM, TWT
DRAWN BY:	TWT, JMM
CHECKED BY:	BCM

SHEET NAME:

BUILDING #86 - ELECTRICAL DETAILS

E501-86

Mini Power Center: MPC1

PRIMARY VOLTAGE: 480V DELTA
WIRES: 3
ENCLOSURE: NEMA 1 Indoor

PHASES: 1
KVA: 10
SECONDARY: 120/240 Single

CKT	Circuit Description	Trip	Poles		Poles	Trip	Circuit Description	CKT
MPC1-1	RCP - SUMP PUMP	20 A	1		2	20 A	ELEVATOR #1 CAR	MPC1-2
MPC1-3	ELEVATOR #2 CAR	20 A	2					MPC1-4
MPC1-5					1	20 A	RCP - ELEV MACH. RM	MPC1-6
MPC1-7	LTG - EL. MACH RM	20 A	1		1	20 A	RCP - ELEVATOR PIT	MPC1-8
MPC1-9	CONDENSATE PUMP	20 A	1		2	15 A	HEAT PUMP - ELEV MACH RM	MPC1-10
MPC1-11								MPC1-12
MPC1-13								MPC1-14
MPC1-15								MPC1-16
MPC1-17								MPC1-18

Notes:

New Panel: DPHN1

VOLTS: 480/277 Wye
WIRES: 4
ENCLOSURE: NEMA 1 Indoor

PHASES: 3
MAIN: 200 A
MAIN TYPE: MCB (1)(2)

CKT	Circuit Description	Trip	Poles		Poles	Trip	Circuit Description	CKT
DPHN1-1	MPC1	30 A	2					DPHN1-2
DPHN1-3								DPHN1-4
DPHN1-5								DPHN1-6
DPHN1-7								DPHN1-8
DPHN1-9								DPHN1-10
DPHN1-11								DPHN1-12
DPHN1-13								DPHN1-14
DPHN1-15								DPHN1-16
DPHN1-17								DPHN1-18
DPHN1-19								DPHN1-20
DPHN1-21								DPHN1-22
DPHN1-23								DPHN1-24
DPHN1-25								DPHN1-26
DPHN1-27	ELEVATOR #2 (1)(2)	100 A	3		3	100 A	ELEVATOR #1 (1)(2)	DPHN1-28
DPHN1-29								DPHN1-30

Notes:
1) Provide breaker with Eaton LSI PXR10 trip units, or approved equal.
2) Perform a coordination study on the new panel.. Perform all field verification required for the study. Adjust all trip settings to meet the recommendations of the study.

LIGHT FIXTURE SCHEDULE

TAG	MFR	MODEL	LUMENS	COLOR TEMP.	VOLTS	WATTS	COMMENTS
F1	LUMINAIRE LED	ESF18-NODIM-50W-40K-MVOLT-CLP-GRY-EMB310-WL-NOOCC	5,280 lm	4,000 K	120-277	50 W	WALL MOUNTED VANDAL RESISTANT LED FIXTURE; CLEAR; PRISMATIC LENS; GRAY HOUSING; WET LOCATION; EMERGENCY BACKUP (1,200 LUMENS)
F2	LITHONIA	CSSL485000LMMVOLTT40K80CRI	5,000 lm	4,000 K	120-277	40 W	LED STRIPLIGHT. DIFFUSE ACRYLIC LENS. SURFACE MT

ENCLOSED BREAKER SCHEDULE

TAG	SERVES	POLES	TRIP	VOLTAGE	ENCLOSURE	DESCRIPTION
EB1-86	ELEVATOR #1 POWER	3	100 A	480 V	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY
EB2-86	ELEVATOR #2 POWER	3	100 A	480 V	NEMA 1	ENCLOSED BREAKER W/ SHUNT TRIP CAPABILITY

DISCONNECT SWITCH SCHEDULE

TAG	SERVES	POLES	VOLTAGE	DEVICE RATING	FUSE	ENCLOSURE	DESCRIPTION
SW1-86	ELEVATOR #1 CAR	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH
SW2-86	ELEVATOR #2 CAR	2	240 V	30 A	20 A	TYPE1	FUSIBLE DISCONNECT SWITCH

EXIT & EMERGENCY LIGHTING SCHEDULE

TAG	MFR	MODEL	DESCRIPTION
E1	LITHONIA	LHQMLEDRHOSD	COMBINATION EXIT SIGN W/ EMERGENCY FIXTURES. WHITE HOUSING W/ RED LETTERING. UNIVERSAL MOUNTED.

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BUILDING #86 - ELECTRICAL SCHEDULES

E601-86

PLUMBING ABBREVIATIONS

A	
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABLITIES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
B	
BB	BASEBOARD
BC	BALANCING COCK
BD	BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BLR	BOILER
BLW	BELOW
BO	BLOW OFF
BTM	BOTTOM
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
C	
CA	COMPRESSED AIR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CDL	CONDENSATE DRAIN LINE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHKV	CHECK VALVE
CHWR	CHILLED & HOT WATER RETURN
CHWS	CHILLED & HOT WATER SUPPLY
CHWS&R	CHILLED & HOT WATER SUPPLY AND RETURN
CIRC	CIRCULATING
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
CLG	CEILING
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
C/O	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWFT	CONDENSER WATER FROM TOWER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SUPPLY AND RETURN
CWTT	CONDENSER WATER TO TOWER
D	
D	DEEP
Db	DRY BULB TEMPERATURE(ºF)
DCO	DOUBLE CLEAN OUT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGRAM
DISCH	DISCHARGE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPT	DEW POINT TEMPERATURE(ºF)
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
E	
EA	EACH
EC	ELECTRICAL CONTRACTOR
EFF	EFFICIENCY
ELEC	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER(BOTTOMS FLAT)
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATUR(ºF)

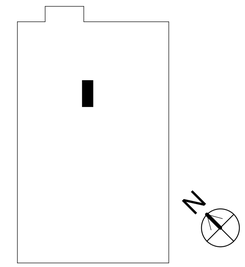
F	
ºF	FAHRENHEIT
FA	FREE AREA
FB	FREE BLOW
F&T	FLOAT AND THERMOSTATIC TRAP
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCO	FLOOR CLEAN OUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FDN	FOUNDATION
FF	FOULING FACTOR
FIN	FINISHED
FLA	FULL LOAD AMPS
FLG	FLANGE
FLR	FLOOR
FNL	FUNNEL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOS&R	FUEL OIL SUPPLY AND RETURN
FOV	FUEL OIL VENT
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE/FEET
FTG	FITTING
FURN	FURNISH
FV	FACE VELOCITY
FW	FEED WATER
G	
G	GAS
GALV	GALVANIZED
GA	GAUGE, GAGE
GC	GENERAL CONTRACTOR
GCWR	GLYCOL CHILLED WATER RETURN
GCWS	GLYCOL CHILLED WATER SUPPLY
GHWR	GLYCOL HOT WATER RETURN
GHWS	GLYCOL HOT WATER SUPPLY
GLV	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAV	GRAVITY
GRV	GRAVITY ROOF VENTILATOR
GV	GATE VALVE
H	
H	HEIGHT
HB	HOSE BIBB
HC	HEATING CONTRACTOR; HANICAPPED
HD	HEAD/HUB DRAIN
HG	MERCURY
HGR	HANGER
HP	HORSEPOWER/HEAT PUMP
HORIZ	HORIZONTAL
HPD	HIGH PRESSURE DRIP
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HTR	HEATER
HUH	HORIZONTAL UNIT HEATER
HV	HIGH VELOCITY
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HWBG	HOT WATER BELOW GRADE
HWOH	HOT WATER OVER HEAD
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IN-WG	INCHES-WATER GAGE
INSUL	INSULATION
IPS	IRON PIPE SIZE
IVS	ISOLATION VALVE STATION
IW	INDIRECT WASTE
J	
JT	JOINT
K	
KS	KITCHEN SINK
L	
L	LENGTH
LAV	LAVATORY
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LP	LOW PRESSURE
LPD	LOW PRESSURE DRIP
LPR	LOW PRESSURE RETURN
LPG	LOW PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LV	LOW VELOCITY
LVG	LEAVING
LWCO	LOW WATER CUTOFF
LWT	LEAVING WATER TEMPERATURE(ºF)

M	
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MPD	MEDIUM PRESSURE DRIP
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
MS	MINI-SPLIT SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MWT	MEAN WATER TEMPERATURE(ºF)
N	
N	NORTH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED; NOISE CRITERIA
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NMAG	NONMAGNETIC
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O	
OA	OVERALL; OUTSIDE AIR
OC	ON CENTER
OCC	OCCUPANCY
OCPD	OVERCURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER; OUTSIDE DIMENSION
ODS	OXYGEN DEPRIVATION SENSOR
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
OFD	OVER FLOW DRAIN
OH	OVERHEAD
OPER	OPERATED
OPP	OPPOSITE
OPT	OPTIONAL; OPTIMUM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSV	OIL SAFETY VALVE
OUT	OUTLET
OVC	OVERCURRENT
OVF	OVERFLOW
OZ	OUNCE
P	
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP/PUMP
PE	PNEUMATIC - ELECTRIC
PG	PRESSURE DROP/PUMP DISCHARGE
PH	PHASE
PLBG	PLUMBING
PNL	PANEL
PR	PANEL RADIATOR
PRESS	PRESSURE
PRV	POWER ROOF VENTILATOR/PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	PRESSURE/TEMPERATURE TAP
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
RA	RELIEF/RETURN AIR
RAD	RADIATOR
RAF	RETURN AIR FIXTURES
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED/RECEIVED
REFRIG	REFRIGERANT
REG	REGISTER
REINF	REINFORCED
REQD	REQUIRED
RET	RETURN
REV	REVISION
RF	RETURN/RELIEF FAN
RH	REHEAT COIL
RHG	REFRIGERANT HOT
RL	REFRIGERANT LIQUID
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
RWC	RAIN WATER CONDUCTOR

S	
SA	SUPPLY AIR
SCH	SCHEDULE
SDPR	SMOKE DAMPER
SENS	SENSIBLE
SEP	SEPARATOR
SF	SUPPLY FAN
SHT	SHEET
SK	SINK
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SPGR	SPECIFIC GRAVITY
SQ	SQUARE
SQFT	SQUARE FOOT
SS	STAINLESS STEEL UNIT
STAT	STATIC
STD	STANDARD
STL	STEEL
STR	STRAINER
SUP	SUPPLY
SV	SAFETY VALVE
SW	SWITCH
T	
TA	THROW AWAY
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TH	THERMOMETER
THK	THICK
TK	TANK
TMV	THRTMOSTATIC MIXING VALVE
TOT	TOTAL
TP	TRAP PRIMER/TRAP PRIMER SUPPLY
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
UC	UNDERCUT
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
V	
V	VOLTAGE/VALVE/VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VFS	VENTURI FLOW STATION
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THROUGH ROOF
W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WA	WATER HAMMER ARRESTER
Wb	WET BULB TEMPERATURE(ºF)
WC	WATER COLUMN/WATER CLOSET
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WALL HEATER
WL	WATER LEVEL
WP	WEATHERPROOF
WT	WEIGHT
Y	
YCO	YARD CLEANOUT
Z	
Z	ZONE
ZCV	ZONE CONTROL VALVE

PLUMBING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEMS AS INDICATED ON THE DRAWING, AS SPECIFIED, AND REQUIRED BY CODE.
2. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB w/ SPACE FOR INSULATION IF REQUIRED. PIPING IS TO BE "TOP DOWN".
3. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.
5. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAINS VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
6. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.
7. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
8. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER CURRENT I.P.C. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
10. COORDINATE ALL STUB-UPS, EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING.
11. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
12. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.



KEY PLAN
N.T.S.

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WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
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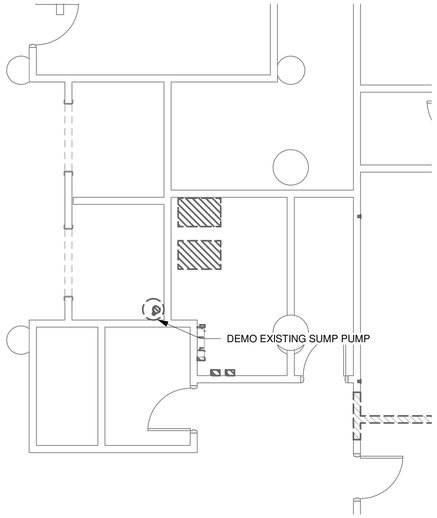
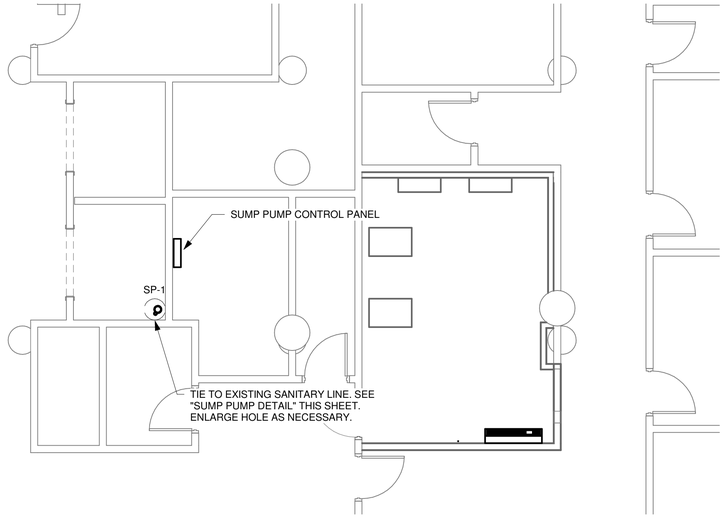


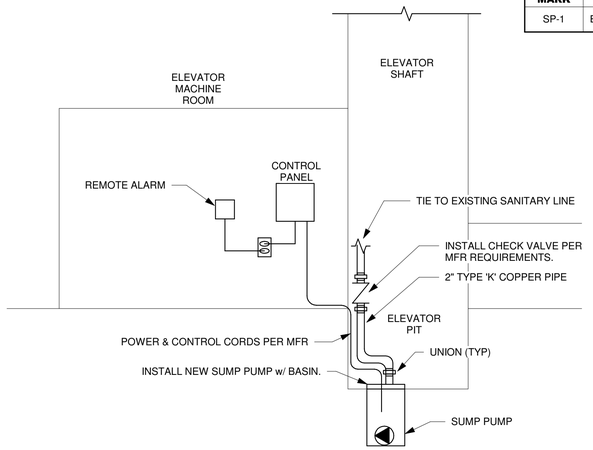
1 BASEMENT PLUMBING DEMO. PLAN
3/16" = 1'-0"



2 BASEMENT PLUMBING PLAN
3/16" = 1'-0"

SUMP PUMP SCHEDULE

MARK	SERVES	MFR	MODEL	FLOW RATE	HEAD	HP	PHASE	VOLTS	MCA	MOCP	COMMENTS
SP-1	ELEVATORS #1 AND #2	LIBERTY PUMPS	ELV280	30 GPM	20'	1/2	1	115 V	15 A	20 A	SUMP PUMP W/ CONTROL PANEL, REMOTE ALARM, OILTECTOR CONTROLS.



3 SUMP PUMP DETAIL
DRAWING NOT SCALABLE

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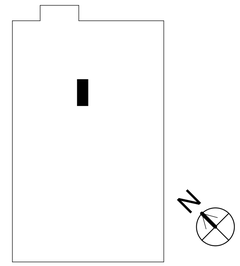
7. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT w/ ACCESSIBLE STOPS.
8. ALL PIPING WORK SHALL BE COORDINATED w/ ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. WASTE PIPING TO BE P40 PVC (BURIED), CAST IRON NO-HUB (EXPOSED). VENT SANITARY PIPING AS NECESSARY PER CURRENT I.P.C. VENT THROUGH THE ROOF SUCH THAT THE OUTSIDE AIR INTAKE IS MIN. OF 10'-0" FROM VENT.
10. COORDINATE ALL STUB-UPS. EXACT FIXTURE TYPE AND SIZES, ETC. w/ GENERAL CONTRACTOR AND FOR FIT w GENERAL CONTRACTOR INSTALLED CABINETRY, ETC. AND FOR FINAL WALL LOCATIONS. FIELD ADJUST LOCATIONS FOR COORDINATION AS NECESSARY. AVOID EXCESSIVE ADDITIONAL PIPE FITTINGS. PRESSURE TEST ALL SUBGRADE PIPING.
11. FINAL COORDINATION OF SCOPE OF WORK, DIMENSIONS, FIXTURE PLACEMENT, ROUTING, ETC. IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS PRIOR TO BIDDING. VERIFY ALL FIELD CONDITIONS AND MEASUREMENTS PRIOR TO BIDDING. COORDINATE ALL WORK w/ OTHER TRADES. COORDINATE ALL MOUNTED DEVICES w/ ALL OTHER TRADES PRIOR TO INSTALLATION. FIRESTOP ALL PENETRATIONS OF FIRE WALL (SEE ARCH. PLANS) AND FLOORS.
12. ALL WORK TO MEET REQUIREMENTS OF CURRENT INTERVENTIONAL PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, STATE AND LOCAL CODES AND REQUIREMENTS AND INTERNATIONAL FUEL GAS CODE.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.
WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234
PA OFFICE:
429 LAUREL RUN ROAD
CARMICHAELS, PA 15320
PH: (724) 966-5655

CONSULTANT:
Montum Architecture
Montum Architecture, LLC
55 ER Path
Keyser, WV 26726
304-276-7151
www.montumarch.com

SEAL:
BRIAN C. MILLER
REGISTERED
15184
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:
CONSTRUCTION DOCUMENTS

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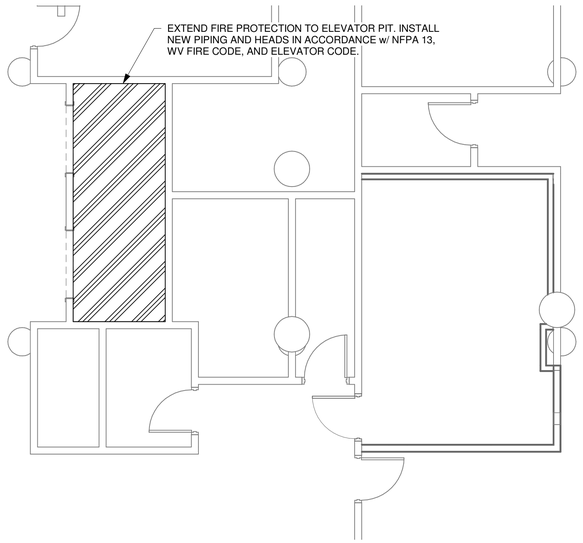
PROJECT NUMBER:	19006
ORIGINAL PAGE SIZE:	22x34
DESIGNED BY:	BCM, TWT
DRAWN BY:	JMM
CHECKED BY:	BCM

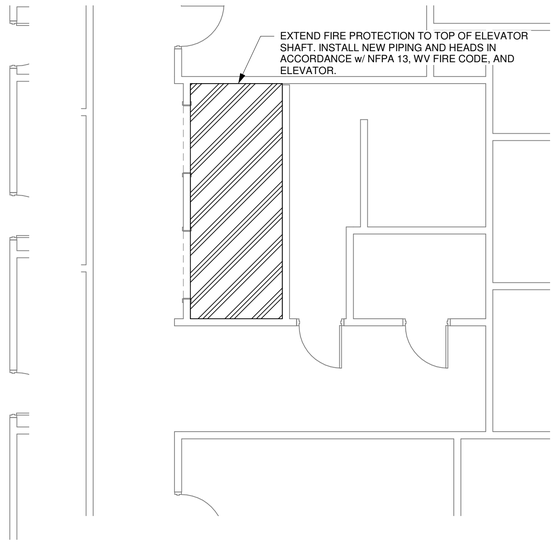
SHEET NAME:
BUILDING #86 - DEMOLITION & NEW PLUMBING PLANS

P101-86



1 BASEMENT FIRE PROTECTION PLAN

3/16" = 1'-0"

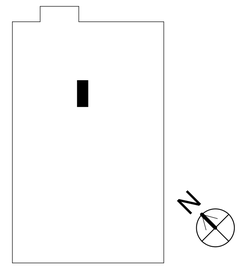


2 FOURTH FLOOR FIRE PROTECTION PLAN

3/16" = 1'-0"

FIRE PROTECTION NOTES

1. PROVIDE FIRE PROTECTION SYSTEM DESIGN AND INSTALLATION AS NECESSARY TO MEET CODES, STANDARDS, AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ) AND INSURANCE UNDERWRITERS.
2. COORDINATE ALL WORK w/ OTHER TRADES PRIOR TO THE FABRICATION OR INSTALLATION OF ANY PIPING.
3. PROVIDE SYSTEM DEVICES, PIPING, AND COMPONENTS AS NECESSARY TO INSTALL A COMPLETE FIRE PROTECTION SYSTEM. THE EXISTING SYSTEM COMPONENTS AND PIPING MAY BE REUSED w/ THE APPROVAL OF THE AHJ.
4. RETAIN THE SERVICES OF A NICET LEVEL 4 SYSTEM DESIGNER TO DESIGN AND LAYOUT THE FULL SYSTEM AS NECESSARY TO MEET THE CURRENT NFPA, STATE, AND LOCAL REQUIREMENTS. ZONE THE FIRE PROTECTION SYSTEM AS NECESSARY. PROVIDE ALL DEVICES AS REQUIRED FOR THE INSTALLATION OF A COMPLETE, TEST INSPECTED, CODE COMPLIANT SYSTEM. OBTAIN ALL NECESSARY APPROVALS PRIOR TO INSTALLATION OF SYSTEM. OBTAIN FINAL INSPECTION AS REQUIRED BY AHJ.
5. SUBMIT DETAILED FIRE PROTECTION DRAWINGS, HYDRAULIC CALCULATIONS, & ALL ITEMS STATED ON THE ICC CHECKLIST TO THE CODE REVIEW OFFICIAL. AFTER THE APPROVAL OF THE CODE REVIEW OFFICIAL, SEND THE FIRE PROTECTION DRAWINGS & HYDRAULIC CALCULATIONS TO THE ARCHITECT & ENGINEER FOR APPROVAL.
6. DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR MUST FIELD VERIFY ACTUAL CONDITIONS AT THE SITE PRIOR TO PRECEDING w/ THE WORK.
7. COORDINATE w/ LOCAL UTILITY BOARD PRIOR TO THE START OF DESIGN. COPY DESIGN BASIS FLOW TEST DATA TO THE OWNER.
8. PROVIDE DEVICES AND INTERCONNECTION TO THE FIRE ALARM SYSTEM FOR ALL ZONING, NOTIFICATION, AND ALARM AS REQUIRED. COORDINATE w/ FIRE ALARM CONTRACTOR PRIOR TO BIDDING.
9. CENTER HEADS IN CEILING TILES. VERIFY BEFORE INSTALLATION THE EXACT CEILING TYPE & PATTERN.
10. COORDINATE FINAL LOCATIONS OF SPRINKLER HEADS, PIPING, & ALL NEW WORK w/ LIGHT FIXTURES, DIFFUSERS, GRILLES, SMOKE DETECTORS, SPEAKERS, & OTHER CEILING MOUNTED DEVICES. MAKE MINOR MODIFICATIONS TO SUIT.
11. PROVIDE SLEEVES & FIRESTOP SEALANTS WHERE PIPES PENETRATE FIRE RATED FLOORS & WALLS. COMPLY w/ ASTM E-814 & UL 1479.
12. CONFORM TO ICC, FM, NFPA REQUIREMENTS AND/OR OWNER'S INSURANCE UNDERWRITER. OBTAIN PERMITS & REVIEW STAMPS FROM THE A.H.J.
13. PIPING TO BE ROUTED ABOVE CEILING UNLESS OTHERWISE NOTED.
14. ALL CONTROL VALVES SHALL BE MONITORED.
15. THE SPRINKLER SYSTEM SHALL BE DESIGNED & SIZED BY THE SPRINKLER CONTRACTOR. THESE DOCUMENTS SHALL BE USED AS A GUIDE FOR INTENT ONLY. FAST RESPONSE SPRINKLER HEADS ARE TO BE USED WHERE POSSIBLE BY CODE. SPRINKLER CONTRACTOR SHALL INFORM & COORDINATE ALL ELECTRICAL & FIRE ALARM DEVICES w/ THE ELECTRICAL CONTRACTOR.
16. PRIOR TO BIDDING, CONTRACTOR IS TO FIELD VERIFY EXISTING FIRE PROTECTION SYSTEM & PIPING. EXISTING PIPING NEARBY MAY BE TAPPED & EXTENDED PROVIDED IT MEETS THE FLOW & PRESSURE REQUIREMENTS DETERMINED BY THE CONTRACTOR'S NICET 4 SYSTEM DESIGNER & APPROVED BY THE WVSFM'S OFFICE.
17. INSPECTOR'S TEST VALVES SHALL NOT DRAIN ONTO CONCRETE SIDEWALKS, PADS, OR CONCRETE PLAZA'S DUE TO STAINING. IF DRAINING TO GRASS AREA PROVIDE MEANS TO ELIMINATE MUD OF THEIR DEBRIS FROM SPLASHING ONTO BUILDING.



KEY PLAN

N.T.S.

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WV OFFICE:
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CONSULTANT:

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Montum Architecture, LLC
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304-276-7151
www.montumarch.com

SEAL:

PROJECT NAME:

ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:

WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:

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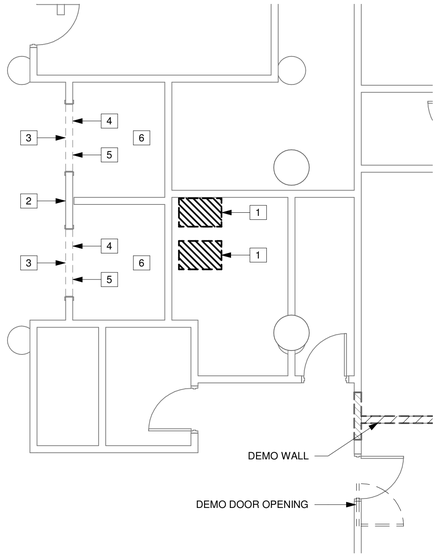
DRAWN BY:	JMM
CHECKED BY:	BCM

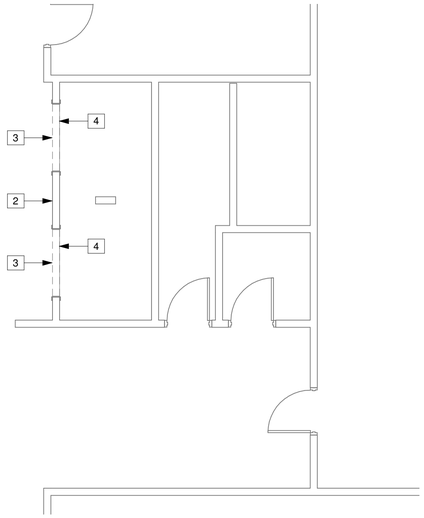
SHEET NAME:

BUILDING #86 - FIRE PROTECTION PLANS

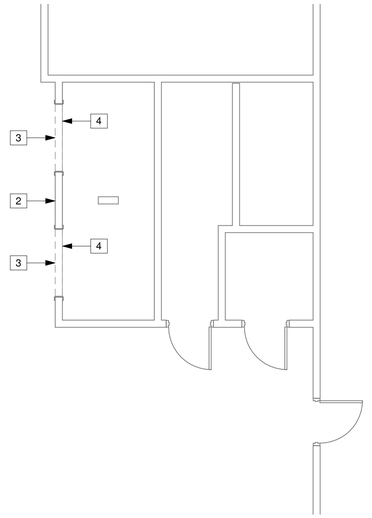
F101-86



1 BASEMENT EQUIP. DEMO. PLAN
3/16" = 1'-0"



2 FIRST FLOOR EQUIP. DEMO. PLAN
3/16" = 1'-0"



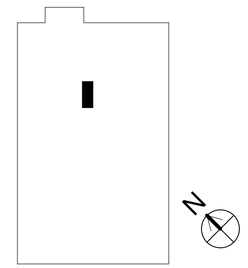
3 SECOND FLOOR EQUIP. DEMO. PLAN
3/16" = 1'-0"

4 THIRD FLOOR EQUIP. DEMO. PLAN
3/16" = 1'-0"

5 FOURTH FLOOR EQUIP. DEMO. PLAN
3/16" = 1'-0"

SHEET NOTES

1. DEMO ELEVATOR HYDRAULIC MACHINE, ETC. FOR COMPLETE REPLACEMENT IN NEW LOCATION.
2. DEMO HALL CALL.
3. DEMO FLAGS AND FLOOR INDICATOR.
4. DEMO DOOR OPERATING SYSTEM.
5. DEMO EXISTING PIT LADDER.
6. DEMO CAR BUFFER AND CYLINDER.



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SEAL:
BRIAN C. MILLER
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15184
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

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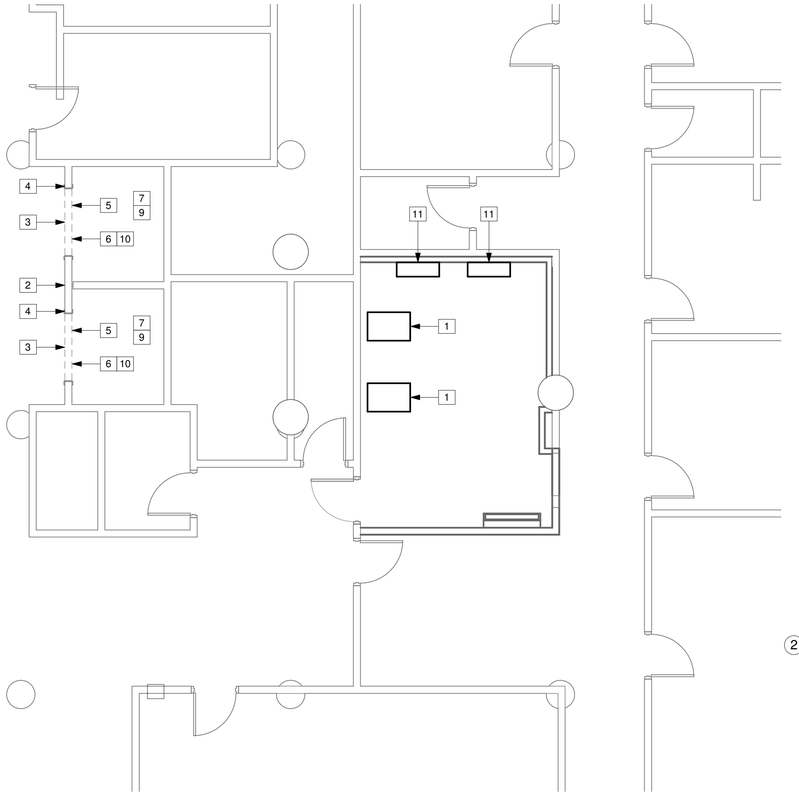
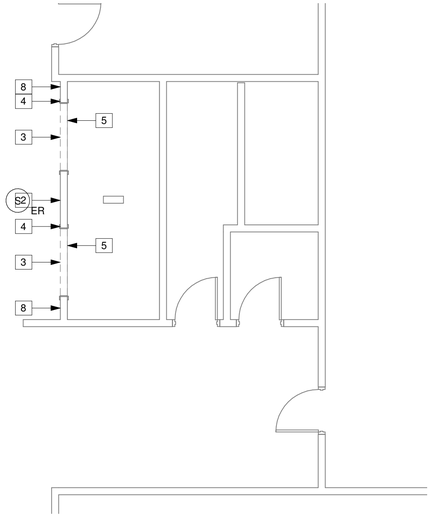
CHECKED BY:	BCM

SHEET NAME:
BUILDING #86 - ELEVATOR EQUIPMENT DEMOLITION PLANS

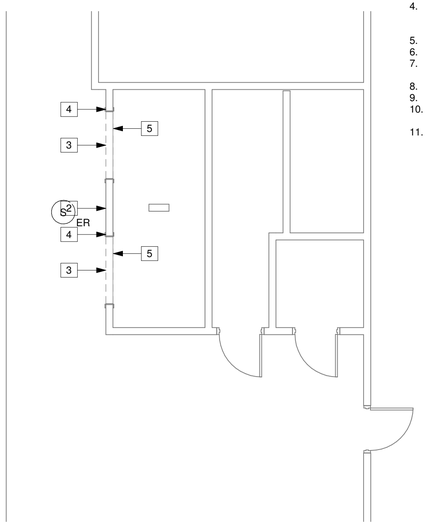
Q001-86



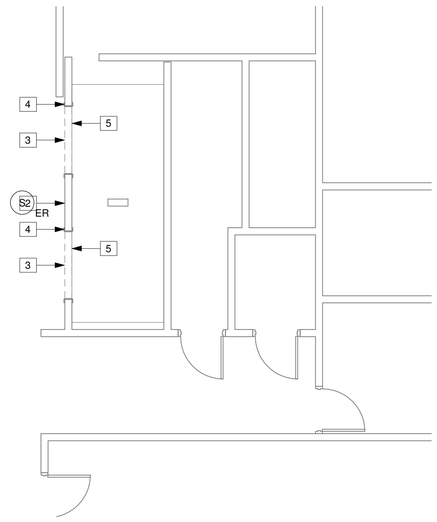
1 BASEMENT EQUIPMENT PLAN
3/16" = 1'-0"



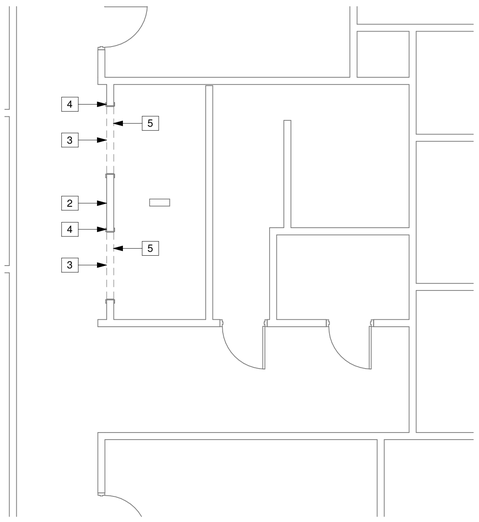
2 FIRST FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



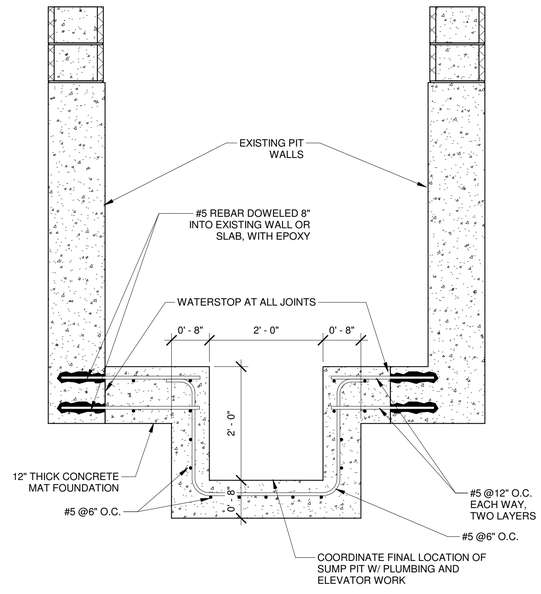
3 SECOND FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



4 THIRD FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



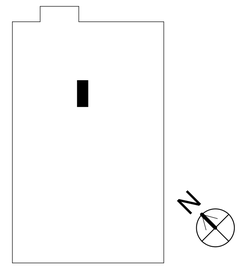
5 FOURTH FLOOR EQUIPMENT PLAN
3/16" = 1'-0"



6 ELEVATOR PIT DETAIL
DRAWING NOT SCALABLE

SHEET NOTES

1. INSTALL NEW ELEVATOR PUMP UNIT CONTROLLER.
2. PROVIDE NEW HALL CALL TO FIT EXISTING ROUGH-INS WITHOUT ADAPTERS.
3. PROVIDE NEW FLAGS AND FLOOR INDICATOR TO FIT ON EXISTING ROUGH-INS WITHOUT ADAPTERS.
4. DOOR JAMBS ARE TO BE CLEANED AND SANDED OF ANY BLEMISHES AND ELECTROSTATICALLY REPAINTED, IF NEEDED, COLOR BY ARCHITECT.
5. NEW DOOR OPERATOR SYSTEM.
6. NEW PIT LADDER w/ STOP SWITCH.
7. ELEVATOR CAR PANEL TO BE RETROFITTED OR REPLACED TO ACCOMMODATE THE ADA VIDEO PHONE.
8. PROVIDE NEW SEPARATE FIRE MAN'S HAT.
9. INSTALL NEW CAR BUFFER AND CYLINDER.
10. PAN OFF TOE CATCH WITHIN HOISTWAY AS NECESSARY TO MEET ANSI STANDARDS.
11. INSTALL NEW CONTROLLER.



KEY PLAN
N.T.S.

MILLER ENGINEERING, INC.

WV OFFICE:
54 WEST RUN ROAD
MORGANTOWN, WV 26508
PH: (304) 291-2234

PA OFFICE:
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CONSULTANT:
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304-276-7151
www.montumarch.com

SEAL:
BRIAN C. MILLER REGISTERED 15184 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

PROJECT NAME:
ELEVATOR MODERNIZATION - VARIOUS FACILITIES (PHASE 2): B5, B15, B17, B84, B86

PROJECT OWNER:
WEST VIRGINIA GENERAL SERVICES DIVISION

PROJECT STATUS:
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DRAWN BY:	JMM
CHECKED BY:	BCM

SHEET NAME:
BUILDING #86 - NEW ELEVATOR EQUIPMENT PLANS

Q101-86

PROJECT MANUAL

FOR

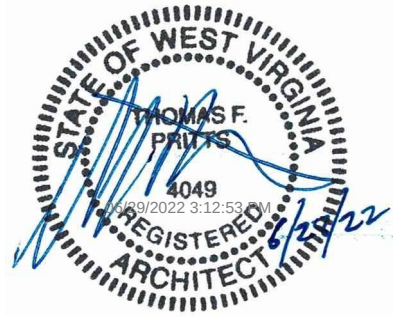
ELEVATOR MODERNIZATIONS VARIOUS FACILITIES (PHASE 2)

OWNER: WV GENERAL SERVICES DIVISION

PREPARED BY:

MILLER ENGINEERING, INC
(304) 291-2234
MEI PROJECT #: 19008
GSD PROCUREMENT FOLDER: 1010703

06-28-2022



SECTION 00 0110

TABLE OF CONTENTS

END OF SECTION

SECTION 00 0112

LIST OF BIDDING DOCUMENTS

CENTRALIZED REQUEST FOR QUOTATIONS INCLUDING THE FOLLOWING: (INCORPORATED BY REFERENCE ONLY)

1.01 INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1.02 GENERAL TERMS AND CONDITIONS

1.03 ADDITIONAL TERMS AND CONDITIONS (CONSTRUCTION CONTRACTS ONLY)

1.04 CERTIFICATION AND SIGNATURE PAGE

1.05 ADDENDUM ACKNOWLEDGEMENT FORM

1.06 GENERAL CONSTRUCTIONS SPECIFICATIONS

1.07 PRICING PAGE

1.08 PURCHASING DIVISION CONSTRUCTION BID SUBMISSION REVIEW FORM

1.09 BID BOND INSTRUCTIONS AND SAMPLE BOND FORM

1.10 DISCLOSURE OF INTERESTED PARTIES TO CONTRACTS FORM

1.11 DRUG-FREE WORKPLACE CONFORMANCE AFFIDAVIT

END OF SECTION

SECTION 00 6000

PROJECT FORMS

THE AIA FORMS FOLLOWING THIS SECTION WILL BE UTILIZED IN THE EXECUTION OF THE PROJECT

END OF SECTION

AIA® Document G701™ – 2017

Change Order

PROJECT: *(Name and address)*
Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

CONTRACT INFORMATION:
Contract For: General Construction

Date:

CHANGE ORDER INFORMATION:
Change Order Number: 001

Date:

OWNER: *(Name and address)*
West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

ARCHITECT: *(Name and address)*
Miller Engineering, Inc.
54 West Run Road
Morgantown, WV 26508

CONTRACTOR: *(Name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original Contract Sum was	$	0.00
The net change by previously authorized Change Orders	$	0.00
The Contract Sum prior to this Change Order was	$	0.00
The Contract Sum will be increased by this Change Order in the amount of	$	0.00
The new Contract Sum including this Change Order will be	$	0.00

The Contract Time will be increased by Zero (0) days.
The new date of Substantial Completion will be

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT	CONTRACTOR	OWNER
Miller Engineering, Inc.		West Virginia General Services Division
(Firm name)	*(Firm name)*	*(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
Brian C. Miller, PE, President		Robert Kilpatrick
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
DATE	DATE	DATE

AIA® Document G702® – 1992

Application and Certificate for Payment

TO OWNER: West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

PROJECT: Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

APPLICATION NO: 001
PERIOD TO:

Distribution to:
OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
FIELD: ☐
OTHER : ☐

FROM CONTRACTOR:

VIA ARCHITECT: Miller Engineering, Inc.
54 West Run Road
Morgantown, WV 26508

CONTRACT FOR: General Construction
CONTRACT DATE:
PROJECT NOS: 19006 / / /

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703®, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM	$0.00
2. NET CHANGE BY CHANGE ORDERS	$0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)	$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	$0.00
5. RETAINAGE:	
a. 0 % of Completed Work (Column D + E on G703)	$0.00
b. 0 % of Stored Material (Column F on G703)	$0.00
Total Retainage (Lines 5a + 5b or Total in Column I of G703)	$0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	$0.00
8. CURRENT PAYMENT DUE	$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$0.00	$0.00
Total approved this Month	$0.00	$0.00
TOTALS	$0.00	$0.00
NET CHANGES by Change Order		$0.00

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached. Use Column I on Contracts where variable retainage for line items may apply.	**APPLICATION NO:** 001
	APPLICATION DATE:
	PERIOD TO:
	ARCHITECT'S PROJECT NO: 19006

A	B	C	D	E	F	G		H	I
			WORK COMPLETED						
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G÷C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00%**	**$0.00**	**$0.00**

User Notes:

AIA® Document G704® – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)* Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86 B5: State Capitol Complex, Charleston, WV B15: 2019 Washington Street East, Charleston, WV 25305 B17: 2101 Washington Street East, Charleston, WV 25305 B84: 1409 Greenbrier Street, Charleston, WV 2	**CONTRACT INFORMATION:** Contract For: General Construction Date:	**CERTIFICATE INFORMATION:** Certificate Number: 001 Date:
OWNER: *(name and address)* West Virginia General Services Division 112 California Ave. 5th Floor Charleston, WV 25305	**ARCHITECT:** *(name and address)* Miller Engineering, Inc. 54 West Run Road Morgantown, WV 26508	**CONTRACTOR:** *(name and address)*

The Work identified below has been reviewed and found, to the Architect's best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.
(Identify the Work, or portion thereof, that is substantially complete.)

Miller Engineering, Inc.		Brian C. Miller, PE, President	
ARCHITECT *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE OF SUBSTANTIAL COMPLETION**

WARRANTIES
The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED
A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within ( ) days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: $

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Firm Name)*	SIGNATURE	PRINTED NAME AND TITLE	DATE
West Virginia General Services Division		Robert Kilpatrick	
OWNER *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**

AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)* Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86 B5: State Capitol Complex, Charleston, WV B15: 2019 Washington Street East, Charleston, WV 25305 B17: 2101 Washington Street East, Charleston, WV 25305 B84: 1409 Greenbrier Street, Charleston, WV 2	**ARCHITECT'S PROJECT NUMBER:** 19006 **CONTRACT FOR:** General Construction	OWNER: ☐ ARCHITECT: ☐ CONTRACTOR: ☐ SURETY: ☐ OTHER: ☐
TO OWNER: *(Name and address)* West Virginia General Services Division 112 California Ave. 5th Floor Charleston, WV 25305	**CONTRACT DATED:**	

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☒ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____

(Signature of authorized representative)

_____

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*
Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

TO OWNER: *(Name and address)*
West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

ARCHITECT'S PROJECT NUMBER:
19006

CONTRACT FOR: General Construction

CONTRACT DATED:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: *(Name and address)*
Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

ARCHITECT'S PROJECT NUMBER: 19006

CONTRACT FOR: General Construction

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

TO OWNER: *(Name and address)*
West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

CONTRACT DATED:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(*Insert name and address of Surety*)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

	(Surety)
	(Signature of authorized representative)
Attest: (Seal):	*(Printed name and title)*

AIA® Document G710™ – 2017

Architect's Supplemental Instructions

PROJECT: *(name and address)*	**CONTRACT INFORMATION:**	**ASI INFORMATION:**
Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86 B5: State Capitol Complex, Charleston, WV B15: 2019 Washington Street East, Charleston, WV 25305 B17: 2101 Washington Street East, Charleston, WV 25305 B84: 1409 Greenbrier Street, Charleston, WV 2	Contract For: General Construction Date:	ASI Number: 001 Date:

OWNER: *(name and address)*	**ARCHITECT:** *(name and address)*	**CONTRACTOR:** *(name and address)*
West Virginia General Services Division 112 California Ave. 5th Floor Charleston, WV 25305	Miller Engineering, Inc. 54 West Run Road Morgantown, WV 26508	

The Contractor shall carry out the Work in accordance with the following supplemental instructions without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.
(Insert a detailed description of the Architect's supplemental instructions and, if applicable, attach or reference specific exhibits.)

ISSUED BY THE ARCHITECT:

Miller Engineering, Inc.
ARCHITECT *(Firm name)*

SIGNATURE

Brian C. Miller, PE, President
PRINTED NAME AND TITLE

DATE

AIA® Document G714™ – 2017

Construction Change Directive

PROJECT: *(name and address)* Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86 B5: State Capitol Complex, Charleston, WV B15: 2019 Washington Street East, Charleston, WV 25305 B17: 2101 Washington Street East, Charleston, WV 25305 B84: 1409 Greenbrier Street, Charleston, WV 2	**CONTRACT INFORMATION:** Contract For: General Construction Date:	**CCD INFORMATION:** Directive Number: 001 Date:
OWNER: *(name and address)* West Virginia General Services Division 112 California Ave. 5th Floor Charleston, WV 25305	**ARCHITECT:** *(name and address)* Miller Engineering, Inc. 54 West Run Road Morgantown, WV 26508	**CONTRACTOR:** *(name and address)*

The Contractor is hereby directed to make the following change(s) in this Contract:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits.)

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:

- ☒ Lump Sum decrease of $0.00
- ☐ Unit Price of $ per
- ☐ Cost, as defined below, plus the following fee:
  (Insert a definition of, or method for determining, cost)
- ☐ As follows:

2. The Contract Time is proposed to remain unchanged. The proposed adjustment, if any, is (0 days).

NOTE: The Owner, Architect and Contractor should execute a Change Order to supersede this Construction Change Directive to the extent they agree upon adjustments to the Contract Sum, Contract Time, or Guaranteed Maximum price for the change(s) described herein.

When signed by the Owner and Architect and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Contractor signature indicates agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this CCD.

Miller Engineering, Inc.	West Virginia General Services Division	
ARCHITECT *(Firm name)*	**OWNER** *(Firm name)*	**CONTRACTOR** *(Firm name)*

SIGNATURE	**SIGNATURE**	**SIGNATURE**
Brian C. Miller, PE, President	Robert Kilpatrick	
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**	**PRINTED NAME AND TITLE**
DATE	**DATE**	**DATE**

AIA® Document G716™ – 2004

Request for Information ("RFI")

TO:
Brian C. Miller, PE
Miller Engineering, Inc.
54 West Run Road
Morgantown, WV 26508

FROM:

PROJECT:
Elevator Modernization - Various Facilities (Phase 2):
B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

ISSUE DATE:

RFI No. 001

REQUESTED REPLY DATE:

PROJECT NUMBERS: 19006 /

COPIES TO:

RFI DESCRIPTION: *(Fully describe the question or type of information requested.)*

REFERENCES/ATTACHMENTS: *(List specific documents researched when seeking the information requested.)*
SPECIFICATIONS: **DRAWINGS:** **OTHER:**

SENDER'S RECOMMENDATION: *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

RECEIVER'S REPLY: *(Provide answer to RFI, including cost and/or schedule considerations.)*

BY	**DATE**	**COPIES TO**

Note: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.

SECTION 00 7200

AIA GENERAL CONDITIONS (AIA A201-2017)

1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT ARE AIA A201-2017

1.02 A BLANK COPY OF THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.

1.03 RELATED REQUIREMENTS

A. SECTION 00 7300 - SUPPLEMENTARY CONDITIONS TO AIA A201-2017: REFER TO DOCUMENT 00 7300 FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

END OF SECTION

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Elevator Modernization - Various Facilities (Phase 2): B5, B15, B17, B84, & B86
B5: State Capitol Complex, Charleston, WV
B15: 2019 Washington Street East, Charleston, WV 25305
B17: 2101 Washington Street East, Charleston, WV 25305
B84: 1409 Greenbrier Street, Charleston, WV 2

THE OWNER:
(Name, legal status and address)

West Virginia General Services Division
112 California Ave.
5th Floor
Charleston, WV 25305

THE ARCHITECT:
(Name, legal status and address)

Miller Engineering, Inc.
54 West Run Road
Morgantown, WV 26508

TABLE OF ARTICLES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.
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INDEX
(Topics and numbers in bold are Section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the

Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work
The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification
§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT
§ 4.1 General
§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract
§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the

Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations

and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor,

prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work,

promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will

affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and

unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents;

.3 terms of special warranties required by the Contract Documents; or

.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to

the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance,

the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the

Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SECTION 00 7300

SUPPLEMENTARY CONDITIONS TO AIA A201-2017

PART 1 GENERAL

1.01 SUMMARY

A. The State of West Virginia Supplementary Conditions to AIA 201-2017 General Conditions of the Contract for Construction amend and supplement the General Conditions defined in Document 00 7200 - AIA General Conditions (A201-2017) & Contract Forms and other provisions of the Contract Documents as indicated below.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

C. A blank copy of the applicable Supplementary Conditions is attached following this page.

D. Successful Vendor will be required to sign these Supplementary Conditions with the Owner, prior to Contract award.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

State of West Virginia

Supplementary Conditions to AIA Document A201-2017
General Conditions of the Contract for Construction

The following Supplementary Conditions modify the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

Order of Precedence: The documents contained in the contract to which this document has been attached shall be interpreted in the following order of precedence:

First Priority – Documents developed by the State or agency and utilized to provide public notice of the solicitation, along with other general terms and conditions shall be first in priority.

Second Priority – This document "Supplementary Conditions to the AIA Document A201-2017 General Conditions of the Contract for Construction" shall be second in priority.

Third Priority – all other AIA documents including, but not limited to, the AIA Document A201-2017 General Conditions of the Contract for Construction and the A101-2017 Standard Form of Agreement Between Owner and Contractor (when utilized) shall be third or lower in priority.

ARTICLE 1
GENERAL PROVISIONS

Add the following Section to Article 1:

§1.05 PARTY RELATIONS

§1.05 The Owner and their consultants, the Architect and their Consultants, and the Contractor and their Subcontractors agree to proceed with the Work on the basis of mutual trust, good faith and fair dealing.

§1.1 BASIC DEFINITIONS

§1.1.1 THE CONTRACT DOCUMENTS

§1.1.1 Delete the last sentence of this Section and substitute the following:

The Contract Documents also include the Bidding Documents (Advertisement or Invitation to Bid, Request for Quotations/Bids, Instructions to Bidders, Form of Proposal, Bid Bond and Sample Forms), Performance Bond, Payment Bond, Maintenance Bond (if applicable), Certificates of Insurance, Special Provisions For Disadvantaged and Women Business Enterprise Utilization (if bound herein).

§1.1.2 THE CONTRACT

§1.1.2 Make the following changes to Section 1.1.2:

In the last sentence, insert "and the Contractor" after "The Architect" and delete "the Architect's" and insert "their respective".

§1.2 Correlation and Intent of Contract Documents

§1.2.1.1 In the second sentence, remove "any law" and insert "West Virginia law or any applicable federal law". In the last sentence, remove "by law" and insert "West Virginia law or any applicable federal law".

§1.7 Digital Data Use and Transmission

§1.7 Delete the last sentence of this section in its entirety.

§1.8 Building Information Models Use and Reliance

§ 1.8 Remove this section in its entirety and replace it with the following:

"Any use of, or reliance on, all or a portion of a building information model must be approved in advance by Owner and will only be permitted if the Parties have agreed upon and executed written documents to memorialize protocols governing the use of, and reliance on, the information contained in the model."

ARTICLE 2
OWNER

§2.1 GENERAL

§ 2.1.1 Add the following after the last sentence:

Notwithstanding the foregoing, the parties understand that since Owner is a government entity, change orders will often require approval by entities in addition to owner. When owner is a state agency, those entities may include, but are not limited to, the West Virginia Attorney General's Office and the West Virginia Purchasing Division. Additionally, approval may be required by agencies providing project funding, including but not limited to, West Virginia School Building Authority and agencies of the United States federal government.

§2.1.2 Delete Section 2.1.2 in its entirety.

§2.1 Add the following Section to 2.1:

§2.1.3 The Owner and the agency funding the project reserve the right to maintain a full time or part time project representative (sometimes referred to as the "Clerk of the Works") at the project site who shall keep the Owner informed of the progress and quality of the Work and responsibilities. The Contractor shall cooperate and assist the Clerk of the Works in the performance of his/her duties. The Clerk of the Works will not interfere with or be responsible for the Contractor's supervision and direction of the Work, and the Contractor's means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work. The Clerk of the Works may facilitate communications between the Owner, Architect, and Contractor but has no authority to make decisions for the Owner, approve modifications to the Contract Documents, the Contract Time, or Contract Sum. Additionally, Contractor is not permitted to rely on or consider decisions made by the Clerk of the Works on behalf of Owner

§2.2 Evidence of the Owner's Financial Arrangements: Delete § 2.2 and all of its subsections in its entirety.

§2.3 Information and Services Required of Owner

§2.3.2 Make the following changes to Section 2.3.2:

In first sentence, delete the period and add ", when required pursuant to West Virginia Code §30-12-1 et seq." Add the following sentence at the end of Section 2.3.2: "If the Owner does not retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located, the Owner will appoint an individual to assume the role and obligations of the Architect pursuant to this Agreement."

§2.3.3 Delete this section in its entirety.

§2.3.4 Delete the last sentence of Section 2.3.4 and substitute the following:

The Contractor shall confirm the locations of each utility. If the Owner has provided geotechnical and other tests to determine subsurface conditions, the Owner will provide such documents to the Contractor; the Contractor acknowledges that it will make no claims for any subsurface or any other conditions revealed by these tests.

ARTICLE 3
CONTRACTOR

§3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§3.2.2 Add the following sentence to the end of Section 3.2.2:

Claims by Contractor resulting from its failure to familiarize itself with the site shall be deemed waived. Additionally, by submitting a bid or otherwise entering into this contract, Contractor acknowledges that it has reviewed and understands the contract documents and the work required by those documents. Any claims arising from Contractor's failure to review and understand the contract documents shall be deemed waived.

§3.2.3 Delete Section 3.2.3 in its entirety and substitute the following:

§3.2.3 The Contractor acknowledges its continuing duty to review and evaluate the Construction Documents during performance of its services and shall immediately notify the Owner and the Architect about any problems, conflicts, defects, deficiencies, inconsistencies or omissions it discovers in or between the Construction Documents; and variances it discovers between the Construction Documents and applicable laws, statutes, building codes, rules and regulations.

§ 3.2.4 Add the following clauses to Section 3.2.4:

§3.2.4.1 If the Contractor performs any Work which it knows or should have known involves a recognized problem, conflict, defect, deficiency, inconsistency or omission in the Construction Documents; or a variance between the Construction Documents and requirements of applicable laws, statutes, building codes, rules and regulations, without notifying the Owner and the Architect prior to receiving written authorization from the Architect to proceed, the Contractor shall be responsible for the consequences of such performance.

§3.2.4.2 Before ordering any materials or doing any Work, the Contractor and Subcontractors shall verify all measurements at the site and shall be responsible for the correctness of same. Discrepancies shall be reported in writing to the Architect prior to proceeding with the Work. No extra charge or compensation will be

entertained due to differences between actual measurements and dimensions indicated on the drawings, if such differences do not result in a change in the scope of Work or if the Architect failed to receive written notice before the Work was performed.

§3.4 LABOR AND MATERIALS

§3.4.1 Vendor must review and comply with the following statutory requirements affecting public construction projects, as well as any other applicable laws that are not referenced herein:

- W. Va. Code § 5-19-1 et seq., relating to domestic steel preference.
- W. Va. Code § 5A-3-56 relating to domestic steel preference, provided that the Owner is a state agency subject to Chapter 5A, Article 3 of the W. Va. Code.
- W. Va. Code § §21-1C-1 *et seq.*, relating to local hiring preference
- W. Va. Code §21-1D-1 *et seq.*, relating to drug free workplace requirements.

§3.4 Add the following Sections to 3.4:

§3.4.4 Where materials and equipment are to be provided by the Owner under the Contract Documents, the Contractor shall notify the Owner in writing as to when materials and equipment are required on the project site in sufficient time to avoid delay in the Work.

§3.4.5 The Contractor shall employ labor on the Project or in connection with the Work, capable of working harmoniously with all trade crafts and any other individuals associated with the Project. The Contractor shall also use its best efforts and implement policies and practices to minimize the likelihood of any strike, work stoppage or other labor disturbance. Except as specifically provided in this Agreement, Contractor shall not be entitled to any adjustment in the Contract sum or Contract time and shall be liable to the Owner for all damages suffered by the Owner occurring as a result of work stoppages, slowdowns, disputes, or strikes by the work force of or provided by Contractor or its Subcontractors.

§3.5 WARRANTY

§3.5 Add the following sentence at the end of Section 3.5:

The Contractor agrees to assign to the Owner at time of Final Completion of the Work, any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such a manner so as to preserve any and all such warranties.

§3.8 ALLOWANCES

§3.8.3 Make the following change to Section 3.8.3:

§3.8.3 Delete "with reasonable promptness" and insert "in sufficient time to avoid delay in the Work."

Add the following Section to 3.8:

§3.8.4 The Contractor shall promptly submit to the Owner an itemized account of any expenditure by the Contractor of the Contract allowance in sufficient detail to allow the Owner to properly account for such expenditure.

§3.9 SUPERINTENDENT/PROJECT MANAGER

§3.9.1 Add the following sentence to the end of Section 3.9.1:

The Contractor may also employ a competent project manager.

§3.9.2 Make the following changes to Section 3.9.2:

In the first sentence, add "and project manager, if applicable" after "superintendent." In the second sentence, add "or project manager, if applicable," after "superintendent."

§3.9.3 Make the following changes to Section 3.9.3:

In the first sentence, add "or project manager, if applicable," after "superintendent." In the second sentence, add "or project manager, if applicable," after "superintendent."

§3.9 Add the following Section to 3.9:

§3.9.4 The Owner shall have the right, at any time, to direct a change in the Contractor's representatives if their performance is deemed unsatisfactory.

§3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§3.10.1 Make the following changes to Section 3.10.1:

In the first sentence, delete the word "promptly" and substitute "by the earliest reasonable date".

Add the following sentence to the end of Section 3.10.1: "The Contractor shall submit an updated construction schedule with each payment application, unless waived by the Owner."

Add the following Sections to 3.10:

§3.10.4 At any time after the first thirty (30) days of the Contract Time, if it is found that the project is two (2) weeks or more behind schedule, beyond approved time extensions, or if at any time during

the last thirty (30) days of the scheduled Contract Time the Contractor is one (1) week or more behind schedule, the Contractor shall immediately submit a plan to the Owner describing how the Work will be placed back on schedule within the remaining Contract Time.

§3.10.5 If the Owner and the Architect determine that the performance of the Work during any stage of the construction schedule last approved by the Owner has not progressed or reached the level of completion required by the Contract Documents, the Owner will have the right to order the Contractor to take corrective measures (hereinafter referred to collectively as Extraordinary Measures) necessary to expedite the progress of the Work, including, without limitation: (1) working additional shifts or overtime; (2) supplying additional manpower, equipment and facilities; and (3) other similar measures. Such Extraordinary Measures shall continue until the progress of the Work complies with the last approved construction schedule. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule after allowing for approved extensions of Contract Time as provided elsewhere in this Agreement. The Contractor is not entitled to an adjustment in the Contract Sum in connection with any Extraordinary Measures required by the Owner. The Owner may exercise its rights under this Section as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with the construction schedule.

§3.11 DOCUMENTS AND SAMPLES AT THE SITE

§3.11 Insert the following sentence at the end of Section 3.11:

The Contractor's compliance with this Section 3.11 shall be a condition precedent to any obligation of the Owner to make Final Payment pursuant to this Agreement.

§3.15 CLEANING UP

§3.15.2 Delete Section 3.15.2 in its entirety and substitute the following:

§3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and may withhold such reasonable costs as necessary for the fulfillment of the Contractor's obligation under this Section 3.15. If the reasonable costs of such cleaning exceed the Contract Sum then due the Contractor, the Contractor shall reimburse the Owner the difference within thirty (30) consecutive calendar days of the Owner's written request.

Any materials, tools, supplies, or other personal property left by the Contractor shall be deemed abandoned property and the Owner shall have no obligation to hold or store the property on behalf of Contractor and may dispose of the abandoned property as if it were property of the State of West Virginia. Provided however, that prior to treating property as abandoned and disposing of it, Owner must first provide Contractor with 10 days notice of its intent to do so. If any materials, tools, supplies or other personal property belong to a subcontractor, then Contractor is obligated to communicate this notice to its subcontractor immediately.

§3.15 Add the following Section to 3.15:

§3.15.3 In order to achieve Substantial Completion, as defined by Section 9.8, for any portion of the Work, the Contractor must have the area where the Work is located fully cleaned and all materials and/or debris removed from site. The Certificate of Substantial Completion will not be issued until the Contractor has met this obligation.

ARTICLE 4
ARCHITECT

§4.1 GENERAL

§4.2 ADMINISTRATION OF THE CONTRACT

§4.2 Make the following changes to Section 4.2:

§4.2.1 In the first sentence of Section 4.2.1 after the word Architect add ", unless otherwise indicated by the Owner,".

§4.2.2 In the first sentence of Section 4.2.2 strike the word "generally."

§4.2.3 In the first sentence of Section 4.2.3 strike the word "reasonably."

§4.2.5 Add the following sentence at the end of Section 4.2.5:

The Architect upon receipt of an Application for Payment from the Contractor shall either review and certify such amounts due for payment or return such Application for Payment to the Contractor for correction(s) within five (5) consecutive business days of receipt.

§4.2.7 Delete the first sentence of Section 4.2.7 and substitute the following:

The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Modify the second to last sentence by removing it in its entirety and replacing it with the following: The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures, unless the Architect has established the required construction means, methods, techniques, sequences, or procedures, or the Contract Documents require such approval.

§4.2.8 Make the following change to Section 4.2.8:

In the first sentence, after the word Architect add ", in consultation with the Owner,".

ARTICLE 5
SUBCONTRACTORS

§5.2 Award of Subcontracts and Other Contracts for Portions of Work

§5.2.1 Add the following sentence to Section 5.2.1.

This provision in no way limits the Contractor's legal obligations to report subcontractors and labor/material suppliers under W. Va. Code § 5-22-1(f) and obtain approval under W. Va. Code § 5-22-1(g) prior to any subcontractor substitution.

§5.4 Contingent Assignment of Subcontracts: This section is removed in its entirety and replaced with the following:

§5.4 Emergency Contracts with Subcontractors:

In the event that the general contractor fails to fulfill its contractual obligations and the performance bond has failed to provide an adequate remedy, Owner has the right to execute emergency contracts with subcontractors to ensure continuation of the work, provided that doing so is in compliance with the laws, rules, and procedures governing emergency contracting authority for Owner, and the emergency contract terms comply with all other applicable laws, rules, and procedures.

ARTICLE 7
CHANGES IN THE WORK

§7.1 General

§7.1.2. In Section 7.1.2. remove the word "alone" and insert "with approval by the Owner."

§7.2 CHANGE ORDERS

§7.2 Add the following Section to 7.2:

§7.2.2 A written Change Order as defined under 7.2.1 above constitutes a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to general conditions, all direct or indirect costs associated with such change and any and all adjustment to the Contract Sum and Contract Time. The parties also understand and agree that if Owner is a state agency, change orders may require approval by entities in addition to Owner. Those entities may include, but are not limited to, the West Virginia Purchasing Division, and the West Virginia Attorney General's Office. Owner and Contractor must discuss the change order approval requirements prior to executing this agreement.

Add the following section to § 7.2

§7.2.3. Allowance for Overhead and Profit: Contractor's overhead and profit for a change order issued under this Article included in the total cost to the Owner shall not exceed based on the following schedule:

.1 For the Contractor, for any Work performed by the Contractor's own forces, fifteen percent (15%) of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, ten percent (10%) of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-Subcontractor involved, for any Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost.

.4. For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, ten percent (10%) of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7. Estimated labor hours shall include hours only for those workmen and working foremen directly involved in performing the Change Order work. Supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) is considered to be included in the allowance for Overhead and Profit. Hand tools are defined as equipment with a value of $1,000 or less. For Contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing Change Order proposals shall be not more than the monthly rate listed in the most current publication of The AED Green Book divided by 176 to arrive at a maximum hourly rate to be applied to the hours the equipment is used performing the Change Order work.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, material, equipment and Subcontractors. Details to be submitted will include detailed line item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item or by drawing as applicable.) Where major cost items are Subcontracts, they shall also be itemized as prescribed above. In no case will a change involving over $10,000 be approved without such an itemization.

.7 Local Business and Occupation Taxes, if applicable, shall be calculated on the cost of the Work, overhead and profit.

.8 Overhead and profit shall not be calculated on changes in the Work involving unit prices. Unit prices are to have overhead and profit included in the price quoted.

.9 Under no circumstances is Contractor permitted to charge for the passage of time (often referred to as general conditions or winter conditions) without an identified, itemized, and concretely provable cost borne by Contractor. Contractor has a duty to mitigate costs during a delay period to the fullest extent possible and Contractor will not be paid for costs that could have been mitigated. Calculating a daily delay rate without properly identifying, itemizing, and proving actual, unmitigateable costs, is prohibited. Contractor understands and accepts that it has the responsibility to prove that costs could not be mitigated prior to submitting a request for payment.

§7.3 CONSTRUCTION CHANGE DIRECTIVES

§7.3.4 Make the following change in Section 7.3.4:

In the fourth line of the first sentence, delete the words "an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount" and substitute "an allowance for overhead and profit in accordance with clauses 7.3.11.1 through 7.3.11.9 below."

§7.3.7 Delete the word "recorded" and replace it with "processed".

§7.3.9 Delete Section 7.3.9 in its entirety and substitute the following:

§7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment provided these amounts have been added to the Contract by Change Order and a purchase order has been issued for the Change Order.

§7.3.10 Add the following sentence to the end of Section 7.3.10:

The Parties will utilize their best efforts to issue a change order within 60 days of agreement being reached, but failure to do so will not give rise to grounds for contract cancellation, penalties, or any other cause of action.

Add the following Section to 7.3:

§7.3.11 In Section 7.3.7, the allowance for overhead and profit for a change directive issued under this Article included in the total cost to the Owner shall not exceed the following schedule:

.1 For the Contractor, for any Work performed by the Contractor's own forces, fifteen percent (15%) of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, ten percent (10%) of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-Subcontractor involved, for any Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost.

.4. For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, ten percent (10%) of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7. Estimated labor hours shall include hours only for those workmen and working foremen directly involved in performing the Change Order work. Supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) is considered to be included in the allowance for Overhead and Profit. Hand tools are defined as equipment with a value of $1,000 or less. For Contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing Change Order proposals shall be not more than the monthly rate listed in the most current publication of The AED Green Book divided by 176 to arrive at a maximum hourly rate to be applied to the hours the equipment is used performing the Change Order work.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, material, equipment and Subcontractors. Details to be submitted will include detailed line item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item or by drawing as applicable.) Where major cost items are Subcontracts, they shall also be itemized as prescribed above. In no case will a change involving over $10,000 be approved without such an itemization.

.7 Local Business and Occupation Taxes, if applicable, shall be calculated on the cost of the Work, overhead and profit.

.8 Overhead and profit shall not be calculated on changes in the Work involving unit prices. Unit prices are to have overhead and profit included in the price quoted.

.9 Under no circumstances is Contractor permitted to charge for the passage of time (often referred to as general conditions or winter conditions) without an identified, itemized, and concretely provable cost borne by Contractor. Contractor has a duty to mitigate costs during a delay period to the fullest extent possible and Contractor will not be paid for costs that could have been mitigated. Calculating a daily delay rate

without properly identifying, itemizing, and proving actual, unmitigateable costs, is prohibited. Contractor understands and accepts that it has the responsibility to prove that costs could not be mitigated prior to submitting a request for payment.

§7.4 Minor Changes in Work. Insert the following sentence at the end of section 7.4:

"Contractor may request that Architect provide written confirmation that Owner has agreed to the minor change, and if requested, Architect will provide it."

ARTICLE 8
TIME

§8.3 DELAYS AND EXTENSIONS OF TIME

§8.3.1 In the first sentence, delete "unusual delay in deliveries," and add "unmitigatable costs attributable to" before the words "adverse weather conditions."

ARTICLE 9
PAYMENTS AND COMPLETION

§9.1 Contract Sum

§9.1.2 Add the following sentence to the end of section 9.1.2:

"Any equitable adjustment of unit prices must be processed as a change order to the contract"

§9.2 SCHEDULE OF VALUES

§9.2 Make the following changes to Section 9.2:

In the first sentence add "and the Owner" after the first reference to the Architect. In the second sentence add "or the Owner" after Architect. Remove the last sentence in its entirety and replace it with the following:

"Any changes to the schedule of values shall be submitted to the Architect and the Owner and supported by such data to substantiate its accuracy as the Architect or owner may require. This schedule, unless objected to by the Architect or the Owner, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment."

§9.3 APPLICATIONS FOR PAYMENT

§9.3 Make the following changes to Section 9.3:

§9.3.1 In the first sentence add "and the Owner" after the first reference to the Architect and add "and other required documents" after the words "schedule of values."

§9.3.1.1 Delete clause 9.3.1.1 in its entirety and substitute the following:

§9.3.1.1 Such applications may include requests for payment on account of changes in the Work authorized by Construction Change Directives and Change Orders only after a purchase order has been issued for the Work affected.

§9.3.1 Add the following clauses to Section 9.3.1:

§9.3.1.3 Until the Work is fifty percent (50%) complete, the Owner will withhold as retainage 10% of the amount due the Contractor on account of progress payments. At the time the Work is fifty percent (50%) complete and thereafter, if the manner of completion of the Work and its progress are and remain satisfactory to the Owner and Architect, and in the absence of other good and sufficient reasons, the Architect will, on presentation by the Contractor of Consent of Surety, authorize any remaining partial payments to be paid in full.

§9.3.1.4 The full Contract retainage may be reinstated if the manner of completion of the Work and its progress do not remain satisfactory to the Owner and Architect, if the Surety withholds its consent, or for other good and sufficient reasons.

§9.4 CERTIFICATES FOR PAYMENT

§9.4.1 After the phrase "in the full amount of the Application for Payment," insert the phrase "less any retainage withheld pursuant to section 9.3.1.3,".

§9.6 PROGRESS PAYMENTS

§9.6.7 Delete Section 9.6.7 in its entirety.

§9.6.8 Delete Section 9.6.8 in its entirety.

§9.7 FAILURE OF PAYMENT

§9.7 Make the following changes in Section 9.7:

In line two, change "seven days" to "sixty days." In line four, delete "binding dispute resolution" and substitute "the West Virginia Claims Commission"

§9.8 SUBSTANTIAL COMPLETION

§9.8.3 Add the following clause to Section 9.8.3:

If Architect is required to perform more than one inspection under this subsection, Contractor shall be responsible for paying the Owner for the cost of the additional inspection, which will be paid by Owner to Architect, at the hourly rate established in the contract between Owner and Architect.

§9.8.5 Add the following clause to Section 9.8.5:

§9.8.5.1 The payment of retainage shall be sufficient to increase the total payments to ninety-five percent (95%) for the Work or designated portion thereof being accepted as Substantially Complete, less any amounts as the Architect shall determine for any Work that is not complete, not in accordance with the Contract Documents, or for unsettled claims.

§9.10 FINAL COMPLETION AND FINAL PAYMENT

§9.10.1 Add the following to the end of Section 9.10.1:

If Architect is required to perform more than one inspection under this subsection, Contractor shall be responsible for paying the Owner for the cost of the additional inspection, which will be paid by Owner to Architect, at the hourly rate established in the contract between Owner and Architect.

§9.10.2 Make the following changes in Section 9.10.2:

In the first sentence, delete "for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner)."

Add the following clause to Section 9.10.2:

§9.10.2.1 Before final payment is due the Contractor, all applicable State and local taxes must be paid. If requested by the Owner, the Contractor shall present evidence that payment or satisfaction of all such tax obligations has been made.

§9.10.3 Add the following clause to Section 9.10.3:

9.10.3.1 Unless and to the extent final completion is delayed through no fault of the Contractor as provided in Section 9.10.3, the Owner shall be under no obligation to increase payments above ninety-five percent (95%) until final completion of the Work is Certified by the Architect.

§9.10.4 Make the following changes in Section 9.10.4:

In the first sentence, delete the word "the" and replace it with "Unless and until the Contractor makes a subsequent Claim against the Owner, the".

Add the following as the last sentence. "Neither the Owner's offer of a final payment nor its acceptance by the Contractor shall legally prevent or limit the Owner's right to assert any and all counterclaims in litigation filed by the Contractor as allowed in section 15.1.8."

Add the following Sections to Article 9:

§9.11 LIQUIDATED DAMAGES

§9.11.1 The Owner will suffer financial loss if the Work is not Substantially Complete within the Contract Time as defined in Article 8, and if final completion is not achieved within the specified time frame following Substantial Completion. As liquidated damages, and not as a penalty, the Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sum(s) stated in this Agreement and/or purchase order.

§9.11.2 Allowances may be made for delays due to shortages of materials and/or energy resources, subject to proof by documentation, and also for delays due to strikes or other delays beyond the control of the Contractor. All delays and any claim for extension of Contract Time must be properly documented in accordance with Section 15.1.5 by the Contractor and must be made within the time limits stated in Section 15.1.2.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

§10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

§10.2.8 Make the following changes to Section 10.2.8:

In the first sentence, delete "within a reasonable time not exceeding 21 days" and substitute "immediately".

§10.3 HAZARDOUS MATERIALS

§10.3.3 Delete Section 10.3.3 in its entirety.

ARTICLE 11
INSURANCE AND BONDS

§11.1 CONTRACTOR'S LIABILITY INSURANCE

§11.1.2 Add the following to the end of §11.1.2.

At a minimum the Contract shall provide, at the Contractor's Expense:

§11.1.2.1. a Performance Bond and a Labor and Material Payment Bond for 100% of the Contract Sum and, if applicable, a two-year roofing Maintenance Bond for the full value of the roofing system.

§11.1.2.2 An attorney-in-fact who executes the bonds on behalf of the surety shall affix thereto a certified and current copy of power of attorney.

§11.1.2.3 The bonds shall be issued on State of West Virginia forms. The Contractor shall deliver the required bonds and all other contract documents to the Owner not later than 15 days following receipt of the Owner's notice of intent to award a Contract.

§11.2 Owner's Insurance Delete section 11.2 in its entirety.

§11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

§11.4 Section 11.4 is deleted in its entirety.

§11.5.1 Make the following changes in Section 11.5.1:

In the first sentence, substitute "Contractor" for "Owner" each time the latter word appears.

§11.5.2 Delete Section 11.5.2 in its entirety and substitute the following:

§11.5.2 Prior to settlement of insured loss, the Contractor shall notify the parties of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The parties shall have 14 days from the receipt of notice to object. If no objection is made, the Contractor shall proceed as proposed and allocate the settlement accordingly. If such objection is made, the dispute shall be resolved as provided in Section 15.4. The Contractor, in that case, shall make settlement with insurers in accordance with directions of the Court. If distribution of the insurance proceeds as directed by the Court is required, the Court will direct such distribution. Any work to repair the damage will be incorporated into the contract as a change order.

ARTICLE 13
MISCELLANEOUS PROVISIONS

§13.4 TESTS AND INSPECTIONS

§13.4.1 Remove the phrase "so require" and insert in its place "prohibit delegation of the test to Contractor"

§13.6 INTEREST

§13.6 Delete Section 13.5 in its entirety and substitute the following:

Notwithstanding any other provision in the Contract Documents, West Virginia Code does not authorize the payment of interest on late payments. Accordingly, interest charges for late payment are prohibited.

Add the following Sections to Article 13:

§13.6 WORKERS COMPENSATION

The Contractor shall provide proof of compliance with West Virginia Worker's Compensation laws and regulations.

§13.7 CONTRACTOR'S LICENSE

§13.7.1 West Virginia Code §21-11-2 requires that all persons desiring to perform contractual work in West Virginia shall be duly licensed. The West Virginia Contractor's Licensing Board is empowered to issue a contractor's license.

§13.7.2 West Virginia Code §21-11-11 requires any prospective Bidder to include the Bidder's contractor's license number on its Bid. The successful Bidder will be required to furnish a copy of its contractor's license in a classification appropriate to the Work prior to issuance of a purchase order/contract.

ARTICLE 14
TERMINATION OR SUSPENSION OF THE CONTRACT

§14.1 TERMINATION BY THE CONTRACTOR

§14.1.1 Make the following changes in Section 14.1.1:

At the end of clause 14.1.1.3 delete "; or" and insert a period.

Delete clause 14.1.1.4 in its entirety.

§14.1.3 Delete Section 14.1.3 in its entirety and substitute the following:

§14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exist, the Contractor may, upon seven days written notice to the Owner and Architect, terminate the Contract. In such event, the Contractor shall be paid for all Work performed in accordance with the Contract Documents, for reasonable and proven termination expenses and a reasonable allowance for overhead and profit. However, such payment, exclusive of termination expenses, shall not exceed the Contract Sum as reduced by other payments made to the Contractor and further reduced by the value of Work as yet not completed. The Contractor shall be entitled to reasonable overhead, but not profit, on Work not performed.

§14.2 TERMINATION BY THE OWNER FOR CAUSE

§14.2.4 Delete Section 14.2.4 in its entirety and substitute the following:

§14.2.4 If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other

damages incurred by the Owner and not expressly waived, such excess shall not be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Owner shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§14.4.1 Delete Section 14.4.1 in its entirety and substitute the following:

§14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause upon thirty days written notice.

§14.4.3 Delete Section 14.4.3 in its entirety and substitute the following:

§14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment from the Owner on the same basis provided in Section 14.1.3 above.

Add the following Section to Article 14:

§14.5 FISCAL YEAR FUNDING

§14.5 Work performed under this Contract is to continue in the succeeding fiscal year contingent upon funds being appropriated by the Legislature for this Work. In the event funds are not appropriated for this Work, this Contract becomes of no effect and is null and void after June 30.

ARTICLE 15
CLAIMS AND DISPUTES

§15.1 Claims

§15.1.2 TIME LIMITS ON CLAIMS

§15.1.2 Delete Section 15.1.2 in its entirety and substitute the following:

Any applicable statute of limitations shall be in accordance with West Virginia Code.

§15.1.3 **NOTICE OF CLAIMS** Add the following to § 15.1.3:

§15.1.3.3 All claims, and notice of claims that require an increase in contract time, contract scope, or contract sum must be made in writing.

§ 15.1.8 is added to the Contract as follows:

§ 15.1.8 Counterclaims – In the event that Contractor makes a claim, Owner reserves the right to make a counterclaim and will not be barred from doing so even if final payment has been made.

§15.2 INITIAL DECISION

§15.2.1 In the third sentence of Section 15.2.1 , insert "or litigation" following the word "mediation" and remove the phrase "binding dispute resolution" and replace it with "or litigation".

§15.2.5 Delete the last sentence in Section 15.2.5 and substitute the following:

Approval or rejection of a claim by the Initial Decision Maker shall be final and binding on the parties unless it is pursued further by either party in accordance with Section 15.2.6.

§15.2.6 Make the following change to clause 15.2.6.1:

In the last sentence, delete "or pursue binding dispute resolution proceedings."

§15.2.8 Delete Section 15.2.8 in its entirety.

§15.3 MEDIATION

§15.3.1 Delete "binding dispute resolution" and substitute "litigation in a court of competent jurisdiction."

§15.3.2 Delete Section 15.3.2 in its entirety and substitute the following:

§15.3.2 The parties shall endeavor to resolve their Claims by non-binding mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement.

§ 15.3.3 Remove section 15.3.3 in its entirety

§15.4 ARBITRATION

§15.4 Delete Section 15.4 in its entirety and substitute the following:

§15.4 SETTLEMENT OF CLAIMS

§15.4.1 The Constitution of West Virginia grants the State sovereign immunity from any and all Claims against the public treasury. This immunity applies and is extended to all agencies of the State, including the Owner. It shall be in full force and effect as it relates to this Contract. The West Virginia Legislature, recognizing that certain Claims against the State may constitute a moral obligation of the State and should be heard, has established the West Virginia Claims Commission for this purpose. The Parties understand that this sovereign immunity and the Constitution of the

State of West Virginia prohibit the State and Owner, from entering into binding arbitration. Notwithstanding any provision to the contrary in the Contract Documents, all references to arbitration, regardless of whether they are included in the AIA Document A201-2017 or another related document are hereby deleted and all Claims of the Contractor for monetary relief, and only of the Contractor, arising out of or related to this Contract shall be decided by the West Virginia Claims Commission. The following Sections have been rewritten to bring them into conformance with the foregoing.

§15.4.2 Claims by the Owner may be brought against the Contractor in the Circuit Court of Kanawha County, West Virginia, or in any other court that has jurisdiction, as the Owner may elect.

§15.4.3 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 15.1.6, 9.10.4 and 9.10.5, shall, within 30 days after submission of the decision by the Initial Decision Maker, be settled for the Contractor by the West Virginia Claims Commission or, for the Owner, by the Circuit Court of Kanawha County or any other court of jurisdiction as the Owner may elect.

§15.4.4 Notice of such action shall be filed in writing with the other party to the Contract, and a copy of such notice shall be filed with the Initial Decision Maker and the Architect, if applicable.

§15.4.5 During court proceedings, the Owner and the Contractor shall comply with Section 15.1.3.

§15.4.6 Claims shall be made within the time limits specified in Section 15.2.6.1.

§15.4.7 The party filing a Claim must assert in the demand all Claims then known to that party on which action is permitted.

Add the following Article:

ARTICLE 16
EQUAL OPPORTUNITY

§16.1 COMPLIANCE WITH REGULATIONS UNDER TITLE VI OF THE FEDERAL CIVIL RIGHTS ACT OF 1964 AND EXECUTIVE ORDER 65-2 BY THE GOVERNOR OF WEST VIRGINIA DATED DECEMBER 15, 1965

§16.1.1 The Contractor agrees that it will comply with Title VI of the Federal Civil Rights Act of 1964 (P.L. 88352) and the regulations of the State of West Virginia, to the end that no person in the State, or in the United States, shall on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination under any program or activity for which the Contractor receives any recompense or other consideration of value, either directly or indirectly from the State; and HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this Agreement.

§16.1.2 If any real property or structure thereon is provided or improved, this assurance shall obligate the Contractor, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which any State payment is extended or for another purpose involving the provision of similar services or benefits. If any other goods or services are so provided, this assurance shall obligate the Contractor for the period during which it supplies such goods or services.

§16.1.3 The Contractor recognizes and agrees that such right to provide property, goods or services to the State will be extended in reliance on the representations and agreements made in assurance, and that the State shall have the right to seek judicial enforcement of this assurance. This is binding on the Contractor, its successors, transferee, and assignee, or any authorized person on behalf of the Contractor.

END OF SUPPLEMENTARY CONDITIONS TO AIA DOCUMENT A201-2017

Any provisions of the Contract Documents that conflict with these Supplementary Conditions shall be null and void unless they have been approved in writing by the applicable State purchasing officer and the Attorney General, and are clearly identified as such in the bid documents.

The Owner and Contractor hereby agree to the full performance of the covenants contained herein.

IN WITNESS WHEREOF, the Owner and Contractor have entered into this Agreement as of the effective date as stated in the A101-2017 (when utilized) or other Contract Documents.

Owner:		Contractor:	
By:	_____	By:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

This Supplementary Conditions to AIA Document A201-2017, General Conditions of the Contract for Construction, has been approved as to form on this 20th day of February, 2019, by the West Virginia Attorney General's office as indicated in the signature line below. Any modification of this document is void unless expressly approved in writing by the West Virginia Attorney General's Office.

PATRICK MORRISEY, ATTORNEY GENERAL

BY: _____

DEPUTY ATTORNEY GENERAL

SECTION 01 1000

SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Elevator Modernizations Various Facilities (Phase 2)

B. Owner's Name: WV General Services Division.

C. Engineer's Name: Miller Engineering, Inc

D. The Project consists of the replacement of five (5) elevators (Cars #1, 2, 3, 4 & 6) in Building 5, one (1) elevator (Car #1) in Building 15, one (1) elevator (Car #1) in Building 17, one (1) elevator (Car #1) in Building 84, and two (2) elevators (Cars #1 & 2) in Building 86. All to be performed by the successful bidder.

1.02 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is set forth in the project documents..

B. Scope of alterations work is indicated on drawings.

C. A technical scope of work immediately follows this section.

D. Plumbing: Alter existing system and add new construction, keeping existing in operation.

E. HVAC: Alter existing system and add new construction, keeping existing in operation.

F. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.

G. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.

H. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.

I. Telephone: Alter existing system and add new construction, keeping existing in operation.

J. Security System: Add new access control devices and video cameras where indicated, including interfacing with the owner's existing system for operable access and camera systems.

1.03 WORK BY OWNER

A. Removal of any asbestos containing materials will be by the Owner under separate contract. Successful bidder will coordinate the project work with the asbestos removal contractor as part of the project scope of work.

1.04 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent portions of the existing buildings during the entire construction period. Prior to bidding, review the Summary/ Narrative Scope of Work following this section for details related to the use of the facility and time limits for buildings with one elevator system.

B. Owner intends to occupy the Project upon Substantial Completion.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas of work and spaces designated by the Owner..
   1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Work by Others.
   3. Use of site and premises by the public.

C. Provide access to and from site as required by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Utility Outages and Shutdown:
1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 14 days notice to Owner and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SEE NARRATIVE SCOPE OF WORK IMMEDIATELY FOLLOWING THIS PAGE

END OF SECTION

WV GSD – Elevator Replacements – Phase 2
Summary/ Narrative Scope of Work
28Jun22

NOTICE:

ALL Bidders and Subcontractors are encouraged to review this document prior to bidding. It does not stand alone from, but is part of, the project documents. This scope is a road map to the project work to increase the understanding of the project for bidding purposes. It is not a substitution for thorough review of all the project documents, which is required of all potential bidders prior to bidding. This written scope is part of the bidding/contract documents and contract requirements, and should be distributed to all Subcontractors prior to bidding. All Contractors, subcontractors, and their personnel are required to be fully and appropriately licensed for all work they perform on the project, as required by the WV State Code. Vendor is to coordinate the work of all Subcontractors on this project prior to the submission of a bid.

GENERAL SUMMARY:

Elevator Replacement:
Generally, this project is to replace 5 traction elevators in Building 5 (numbers 1,2,3,4,6), replace the hydraulic elevator in Building 15, replace the pump unit and controls on the Building 17 hydraulic elevator; all located on the grounds of the Capital Complex in Charleston. Additionally, replace the hydraulic elevator in Building 84 on Greenbrier Street, and replace the two hydraulic elevators in Building 86 in Downtown Charleston. The replacements are performance based, while meeting all of the requirements of the project documents. All elevators in this Phase of work are passenger elevators. The scope of each replacement is indicated herein the project documents. The existing rails on all systems will be replaced under the direction of a West Virginia PE. The door frames or “bucks” will remain, but will be reconditioned as indicated in the project documents.

The existing traction elevators and hoisting system including: motor generator, cable drive, cabling, sheaves, gear drive, counterweights, governor systems, all controls, car safeties, car sling, platform, car panels, car floor, car doors, hatchway doors, hall calls, hall indicators, pit over runs, etc., will be removed and replaced with entirely new systems as specified. The traction elevators will be Variable Voltage Variable Frequency (VVVF) AC gearless machines. Similarly, the existing hydraulic systems including: pump unit, cylinder, governor systems, all controls, car safeties, car sling, platform, car panels, car floor, car doors, hatchway doors, hall calls, hall indicators, pit over runs, etc. will be removed and replaced with entirely new systems as specified. In Buildings 17 and 86, a new elevator machine room will be constructed. The elevator systems will be non-proprietary, as defined in the project specifications. The signaling devices, car

panels, car interiors, etc., will have no visible manufacturer or Contractor labels, embossing's, etchings, or other marks. All controllers and cars will have the necessary provisions to permit future installation of access card readers in the car, regardless of whether they are called to be connected in this project.

Pre-bid/ Site Review:

A mandatory pre-bid meeting will be conducted and all potential bidders must attend. The date for the meeting is indicated in the Centralized Request for Quotations (CRFQ). Each meeting will be followed by a walk-through of each elevator system. Any areas where work supporting the project may need to be conducted may also be visited during the walk-through. Bidders are encouraged to bring any Subcontractors to the pre-bid and walk-through. A second walk through for Subcontractors may be scheduled during the pre-bid meeting.

Do not park in assigned parking for the pre-bid. Park only in public access or metered areas. No parking permits will be issued for those attending the pre-bid or walk-through.

Due to the compact nature of the machine areas in question, any COVID related restrictions in place by Executive Order will be followed during the pre-bid and walk-through.

Definition of Substantial Completion:

As this project will involve various elevators being removed from service and restored to service at different times, substantial completion for each individual system is defined as when the elevator system and its associated work is completed, tested, inspected and released by the third party inspector with an operation certificate issued, reviewed and released by the design team, and accepted by the Owner for its intended use. Such completion requirements are referred to as "milestone" completions.

Facility Access During Bidding:

A walk through showing typical conditions will occur after the pre-bid meeting. Subcontractors are invited/ encouraged to attend the pre-bid and bring interested parties. Bidders and subs ARE NOT to attempt to access the non-public areas of the site at any other time for any purpose related to the bid, nor attempt to gain any additional information if in the facility for any other purpose.

ORDER OF WORK/ PHASING:

In order to expedite the acquisition of the elevator systems, which require what is assumed to be a long lead-time, Vendor will provide all necessary submittals for review within thirty (30) days after Notice to Proceed.

Contract Period:
The total contract period requires are found the CRFQ. Certain elevators will achieve individual substantial completion at different times but there will only be one overall Project Substantial Completion related to total contract time and warranties, service agreements, etc. A single contract Notice to Proceed will be issued for the project.

Overall Phasing of Work:
It is likely that the hydraulic elevator systems will have shorter lead times than the traction elevators. As such, it is likely that the hydraulic modifications will be performed first. The Vendor will present a preliminary schedule and plan for accomplishing all the project work within the contract period, for review and approval, within 10 days of notice to proceed. The schedule will be based on delivery commitments from equipment suppliers and will be updated at 30 days. The specific order of work will be finalized at this time and this schedule will be utilized by the Owner to coordinate the impact on buildings, particularly those with one elevator.

Phasing of Modifications and Replacements - Building 5:
Building 5 will have one elevator removed from service at a time for the purpose of replacement. A plan will be developed to ensure the duplex dispatch function remains as centralized a possible to maintain efficiency of the four central passenger cars (# 1, 2, 3, & 4). The executive elevator (#6) may be upgraded before or after the central passenger elevators.

Phasing of Modifications and Replacements - Building 15, 17, 84:
The three elevators will be modified during a period for each determined in consultation with the Owner within 60 days of Notice to Proceed. As each system provides the only ADA access to the building, the Owner will need to plan accommodations related to the elevator being out of service. To minimize the impact on the occupants and the public, the elevator in each building will be out of service for no more than 60 days from out of service to certificate of operation. The vendor will perform all possible preliminary work, such as selective demo, construction or modification of machine spaces, etc. as possible, to prepare for taking the elevator in each building out of service for renovation.

Phasing of Modifications and Replacements - Building 86:
Building 86 will have one elevator removed from service at a time for the purpose of replacement. The vendor will perform all possible preliminary work, such as selective demo, construction or modification of machine spaces, etc. as possible, to prepare for taking the elevator in each building out of service for renovation.

Existing Maintenance Contract and Handover to Vendor for Work:
The elevator systems are under an existing Owner/third-party maintenance contract. Elevators included in this project will be covered by that contract until such time that the modernization Vendor takes them out of service for

replacement or modification. Vendor will only be able to use elevators which they have taken out of service for transportation of materials and equipment required to complete the project. No Vendor use of any elevator for transporting labor, materials or equipment for this project is guaranteed. Vendor may not use an elevator which they have modernized under this contract to transport materials and equipment. Vendor is responsible for maintaining and repairing all elevators from the point at which they are taken out of service until such time that the one-year overall contract warranty period requirement for maintenance is satisfied.

RELATED ITEMS:

Project Documents Note:
Where the words “all”, “typ all”, “typ” or “typical all” are used, the note shall apply to all occurrences on the project, unless otherwise specifically noted, regardless of the indications on the project drawings. Any statement which specifically points out or includes work does not exclude related work found elsewhere in the documents or requirements, it is intended to help point out items of consideration in bidding and anticipate bidder questions.

Coordination of Trades:
The responsibility for all construction coordination lies ultimately with the prime Contractor, but also with each trade involved as part of the bidding process. All trades involved within the project must understand their role within the project in terms of scope of work, the timing of such work, and the overall project schedule set forth in the project documents.

Owner Occupancy Summary:
The Owner will continue to occupy the facilities during construction. Work phasing will be coordinated to accommodate such occupancy and continued operations involving staff and visitors. Work period and outage requirements for the project are described herein.

Selective Demolition:
THIS PROJECT REQUIRES BOTH SCOPE AND TIMING OF SELECTIVE DEMOLITION. Demolition of all existing systems, equipment, and components shall be coordinated with all the other trades involved with the project.

The responsibility for all demolition coordination, scope, and timing lies ultimately with the prime Contractor, but also lies with each trade involved. All systems, components, and equipment indicated by shaded areas on the project drawings will be demolished unless they are to be re-used. The timing of demolition of any systems or equipment must be in such a manner that permits continued operations during construction. Any system or equipment demolished in a manner that disallows for continued operations during construction will be re-installed (or an Engineer-accepted temporary solution will be installed) by the

Contractor at no additional cost to the Owner. No elevator shall be taken out of service without the approval of the Owner.

Anything in any trade which is not re-used in the project must be totally removed from the facility as part of demolition, nothing will be abandoned in place. The Owner reserves the right of first refusal of removed materials and components, but otherwise all will be disposed of in accordance with best industry practices, and local, state, and federal laws.

Warranty:
The entire installed project will have a parts and labor warranty of at least one (1) year, beginning upon the date of substantial completion of the final individual elevator. Maintenance service, as defined in the technical specifications sections pertaining to each type of elevator, will include routine, scheduled preventive maintenance visits, testing, and callout services (for entrapments and malfunctions). Additional 6 and 11 month retraining on equipment, systems and controls, with sufficient time to resolve Owner-discovered concerns, is also required during the warranty period. This maintenance service and retraining will be provided by the vendor at no additional costs to the Owner and is part of the project warrant requirement. Surety must acknowledge these requirements on the bonds provided to be awarded the project. Failure to meet any of the requirements during the warrant period will be grounds for surety action, or for the Owner to pursue action for vendor performance through the State Purchasing Division. Seeking either of these remedies does not rescind the Owner's right to seek other remedies to the Vendor's failure to perform this contractual responsibility.

Each individual elevator, when achieving substantial completion and acceptance by the Owner, will immediately be under warranty, including the requirements for maintenance service. The warranty period for all elevators substantially completed and accepted prior to the date of the substantial completion and acceptance of the final elevator car will extend from their individual dates of substantial completion, through the date of substantial completion of the final elevator car, then for the one (1) year warranty period for the entire project. It is understood that elevator cars completed earlier in the project schedule will have longer warranty periods, and thus longer periods for which the Vendor is responsible for warranty period maintenance services, than the car or cars finished last on the schedule.

At the end of the entire project's one (1) year warranty period, all elevator cars will be added to the Owner's existing elevator maintenance contract.

Best Industry Practices:
All work will be performed in accordance with plans and specifications and in accordance with best industry practices. The Engineer will be the sole authority in regards to this requirement and the decisions of the Engineer will be final.

Location:
The general project locations are the WV GSD Buildings 5, 15 and 17, located in the main WV State Capitol Complex Campus, Kanawha Boulevard East, Charleston, WV, and WV GSD Buildings 84 and 86, in the Charleston Area.

Safety:
All work will be performed in accordance with all local, state, and federal safety regulations and with the Owner's Jobsite Safety Handbook" requirements. See Owner's Additional Requirements, Section 01 1001 of the project manual; including safety protocols such as hot work permits, etc., at all times. No fire alarm system work will be executed without prior written authorization, on a daily basis, from the Owner's Building Supervisor. The authorization must include a detailed description of the work to be performed, the potential impact on the building occupants, emergency on site call numbers for the day, and a sign off confirmation of the system's return to normal.

Outages:
Outages will be coordinated and scheduled with the Owner at least 14 days in advance, in writing. A scheduled outage is tentative until it is confirmed in writing by the Owner and the Engineer.

Existing Drawings Provided:
The original elevator manufacturer's drawings are included in the project documents for general reference. Note that due to age and the likelihood of modifications in the past, the drawings likely do not completely represent the actual installation. The Contractor is to verify all dimensions and any information of concern prior to bidding.

Due Care/ Protection of Buildings:
The requirement to protect the building structure includes protecting all existing finishes from damage, including the floors during movement of components through the building is in effect for all work related to the project. Contractor must use all due care to protect the buildings and their visitors and occupants for damage or harm throughout the project. The Owner's Safety personnel will monitor practices at various times during the performance of the work.

Job Hazard Analysis:
The bidder will perform a detailed job hazard analysis related to the elevator modifications. The Contractor is solely responsible for determining if the work, as performed, will meet safety requirements under OSHA, the owner's Jobsite Safety Handbook, and other applicable codes. Should any portion of the work, as specified, present an undue hazard as identified by this analysis, bidder must submit the result of this analysis as a technical questions prior to the deadline established in the CRFQ, proposing the acceptance of a suggested mitigation.

Each request submitted in such a manner will be addressed by Addendum. By submitting a bid, the Vendor accepts the project's existing safety conditions.

TRADES INFORMATION:

Elevator Car, Signaling Devices, and Hatchway Door Finishes:
The basis of design finishes represent the minimum standard for the material, appearance, texture, and overall aesthetic required for these components. Samples of each material and finish will be submitted for review and approval. Multiple samples may be required to obtain approval. This project has a non-proprietary system requirement.

Architectural/ General Trades:
The work consists of some new construction and minor demolition of existing and modifications to support the replacement of the elevator system. For Buildings 17 and 86, new machine rooms will be constructed with the Building 17 machine room “carved out” of the existing mechanical room. Other machine rooms require modifications as indicated in the project drawings but also generally includes items such as, hole patching, fire-stopping penetrations, sealing existing rated walls and shaft-wall systems, etc. Grinding of concrete floors in areas of the Bldg.5 machine room to eliminate casting protrusions and smooth the floors is included. Shafts require patching and sealing of penetrations to maintain the integrity of the shaft fire rating.

As previously indicated, extensive cleaning and restoration is required for the door jambs and related items. Some cutting and patching will be required related to hall calls, indicators, door jamb and bulkhead work. New elevator lobby device locations may be required and are included. Where existing walls or hard ceiling need patched as a result, paint those areas to the next break or change in direction. Paint all exposed new drywall, steel, doors, frames, etc. installed in the project. Where existing painted substrates are affected by the construction, repaint those areas from corner to corner. Contain these activities with dust enclosures and provide negative air machines as necessary during the work. Any and all shaft hatchways must be continuously barricaded to protect the public or staff from approaching at all times. They must be securely and fully sealed off when Contractor personnel are not on site at the hatchway or working proximate to the open hatchway; this includes break times.

General trades work is required in the hoistways in regards to items such as cleaning, installation of ladders, patching and fire caulk, fire stopping and fire proofing. Installation of sheet metal pans in some shaft areas for personnel protection from toe catch irregularities in the shaft walls, as required by code, is included in the project. Work includes limited concrete demo and installation for new sump pump basins and removal and installation of cylinders with PVC sleeves on hydraulic elevators. Work also includes waterproofing the pit

completely to the first floor landing. Review and coordinate such work with the elevator installer prior to bidding.

The steel elevator door frames have an existing paint finish, which is assumed to be lead-containing. They will require removal of suspected lead-based paint in order to apply the electrostatic paint finish. Investigation and documentation of the original paint color applied to these frames will be completed during this process by the Restoration Specialist. Bidder is required to identify and abate all lead-based paint on the frames as necessary in accordance with state and federal law, and provide all necessary documentation regarding such compliance including reports of testing, manifests, etc. as a closeout submittal.

Mechanical:
The mechanical work is limited to that which supports the elevator replacement and repairs, including demolition of existing systems and installation of new systems in the areas of the elevator machine rooms. Building 5 requires slight modification of the ductwork. Buildings 15 and 84 requires the installation of a mini-split type cooling system. Buildings 17 and 86 require the installation of water source console heat pumps. Additionally, Building 17 requires the modification of the heat pump piping in the mechanical room, including new inline circulators mounted in new locations with associated piping and specialties. The remaining work generally includes minor modifications indicated in the project drawings.

Electrical:
Electrical wiring, conduits, devices, etc. will be provided as necessary to meet all electrical service requirements of the replacement project. Power to demolished equipment and any electric not reused will be demolished to source. Temporary demo will be made safe and maintained in a safe condition until the time of reconnection. All remaining and new equipment will be powered. Verify all power requirements prior to bidding.

There are electrical conduits and wiring that must be removed from certain shafts where indicated on the project drawings. Scope includes security access by card reader for each machine room door. The existing access system in the building will be extended to the machine room with the necessary hardware, wiring, and lock hardware to control access to the machine rooms.

All wiring to the car is to be entirely in the elevator messenger cable, with spare cabling, at substantial completion as indicated in the project specifications. Coordinate all requirements, including specific requirements for the car panels for a finished appearance to the final product, with elevator supplier/ installer prior to bidding.

For all data locations, the RJ 45 Cat 6a jack end will be punched down in the machine rooms. The IDF end will be left with a 20 foot whip at the location in the

data rooms designated by the Owner; for punch down by the Owner's personnel. The cabling in the machine rooms and hoistways must be continuously enclosed in wireway or conduit until they exit the machine room and hoistway. Cabling beyond the hoistway and machine room will be run concealed and will not be surface-mounted in finished areas. It will not damage the building finishes. It will be secured to structure and not to other building systems such as wiring, conduit, ceiling grids, or equipment. All cabling will be plenum rated and continuous from machine room to IDF rack. The exact final routing of the cabling will be reviewed and approved by the Engineer/Owner prior to installation.

Building 5 requires the replacement of the 400A 480 volt distribution panel serving all six elevators in the building with a new panel, served by a new automatic transfer switch. The new panel will be located adjacent to and the transfer switch will occupy the location of the existing panel. The demolition of the existing, reconnection of all elevators to the new panel, installation of the transfer switch, and associated work will occur during a single outage occurring on a weekend coordinated with the Owner.

Building 17 requires the relocation of the fire alarm, security access equipment, and supporting panels and equipment in the mechanical room, to a new location within the room. Existing pump motor starters will be demoed and replaced with new in a new location within the room.

Plumbing:
Plumbing work includes installation of new sump pumps in elevator pits and condensate drain systems for HVAC equipment as indicated in the project drawings. Minor plumbing modifications are required in Building 17 to replace a mop sink in a new location.

Fire Alarm:
FA modifications will be by the Contractor. The fire alarm work generally includes interfacing to the new elevator controller for elevator recall. Fire alarm work will follow the Owner's procedures for notification prior to performing work on the existing fire alarm systems.

Building 5 is served by an Edwards EST3 system.
Building 17 is served by an Edwards EST Quickstart system.
Building 84 is served by an Edwards EST IO500 system.

Buildings 5, 17, and 84 fire alarms system will be modified to accommodate the project.

Building 15 is served by an Edwards EST1 system.
Building 84 is served by a Silent Knight system.

Buildings 15 and 86 will have one Edwards EST IO1000 each, with new remote annunciator panels, installed and serve all the elevator recall functions. The existing systems will be left in place and will slave to the new EST IO1000,

The fireman's elevator controls will be located in the building's fire command center, if so equipped, or at the remote annunciator or elevator lobby as coordinated with the Fire Marshal and Elevator Inspector. All appropriate interfacing between the FA and the elevator controls will be provided by the project, coordinate prior to bidding.

Access control systems will be provided on all cars with existing systems in place at the time of bidding. The card reader will be integrated into the new car panels. Provide new readers and wiring to the card reader controller and elevator controllers in the machine room. If the new reader requires new access controller in the machine room, it will be provided by the project. Provide video camera in car where required in documents and provide all wiring and hardware to integrate into the central campus video monitoring system.

Fire Protection:
FP modifications will be limited to those necessary to affect the project and generally include adjustments and modifications in machine rooms and hoistways. All buildings in the project will have the FP modified to meet the project requirements ***except*** building 15. Building 15 is not sprinkled and therefore does not require the shaft or machine room to be sprinkled. The contractor is responsible for submitting drawings and flow calculations to the West Virginia State Fire Marshal's Office. The drawings and calculations must be prepared by a NICET Level IV certified designer. Once reviewed by the WVSFM Office, a copy of all reviews will be submitted to the Engineer and Owner for record.

Prior to bidding, the contractor is to review the existing fire protection system and piping. As part of the review prior to bidding, the contractor, and their NICET certified designer, will determine the method of extending the existing fire protection system to the areas indicated on the drawings. The contractor and designer must submit calculations during construction to verify there is adequate flow and pressure based upon their designed tie-in point to the existing fire protection system. The completed installation will fully conform to the project requirements and NFPA13.

Structural Modifications:
No major building structural modifications are foreseen in this project. All existing hoisting steel and rail mounting steel will be verified by a WV licensed PE. All necessary modifications to hoisting steel or rail mountings are part of the project and will be performed from sealed drawings and details prepared by a WV licensed PE. This requirement also applies to any and all hoisting steel of a

temporary nature used during construction. The Owner reserves the right to request calculations for all work under this requirement.

Hoisting/ Crane-work:
Cranes will likely be required to remove and place the Elevator 5 machine in machine rooms of Building 5. Review the site locations, site restrictions, and pick length and weight requirements prior to bidding. The site is a crowded site and that must be taken into account in planning the lifts and selecting lifting equipment. Additionally, no direct crane pick is possible for the Building 5 elevators 1, 2, 3, and 4. There is a trap door down to the 11th floor from the machine room which will permit the new equipment to be hoisted up to the machine room mezzanine level; located at an elevation between the 11th floor and the roof elevations. The Bldg.5 freight elevator is new and may be used to move equipment to the 11th floor. The new finishes in the cab and the door jambs, etc., will be protected by plywood during the Building 5 construction period.

As part of the bid, the Contractor will provide the services of a WV licensed Structural PE to evaluate, by on-site inspection, all existing machine room overhead machine hoisting steel prior to its use. A written report indicating suitability to the intended use is required and is a project requirement. Any deficiencies or concerns will be documented to the Owner in the report and repaired or remediated at no additional cost to the project. Special protection of the floor below the trap doors is a project requirement and subject to review by the Owner's Engineer. All lifts or hoists will be done at a time of minimum building occupancy, most likely on weekends. Contractor is responsible for protecting interior walls, floors, finishes, all exterior hardscapes, and plantings from damage during all moving of equipment, hoisting, and crane lifts. Any damage will be repaired by the Contractor to the satisfaction of the Owner.

Crane Lift Plan:
A lift plan must be provided to the Owner's Project Manager and Safety personnel for review and acceptance, prior to performing any lifting operations. The lift plan must include:

- The type, size, model, lifting capacity, certification date and serial number of the crane to be used.
- A list of items to be lifted/moved, including a description of each item's weight, dimensions, center of gravity, and presence of hazardous toxic materials.
- The plan may include sketches showing lifting points, methods of attachment, sling angles, load vectors, boom and swing angles, crane orientations, related capacities, and other factors affecting the equipment and lifting operation.
- The name of the Operator, Rigger and Competent Person.
- Applicable rigging to be used as well as precautions and safety measures.

- A pre-lift meeting to review the plan, must be held before the actual lift, and be attended by the operator rigger(s), competent person and others as required.

A Critical Lift Plan and Critical Lift Checklist, including all of the above requirements and any additional requested information, must be completed by the subcontractor and submitted to Owner's Project Manager and Safety personnel, for review and acceptance, when any of the following conditions exist:

- The load exceeds 75% of the crane's load chart
- Whenever the load and/or travel radius is expected to travel over any portion of an occupied building
- The load exceeds 100 tons
- If the lift involves multiple cranes, a system must be instituted by the controlling entity to coordinate operations.
- The crane is being used to lift personnel
- The Owner or the Design Team has determined that the plan and checklist are necessary for the lift in question

Otherwise, the Owner does not administer any other permitting for crane operation on the Capitol Complex. The Vendor remains responsible for complying with all local, state, and federal requirements for crane operation.

OTHER REQUIREMENTS:

Elevator Monitoring and Supervisory/Control System (EMSCS):
The project will provide, install, program, commission, demonstrate, provide training, and warranty integration to the Owner's web based elevator monitoring and supervisory/control system, which is by Liftnet. The performance specification from the installation of the system is provided for reference in specification section 14 2810. The integration will include Elevators 1, 2, 3, 4, and 5 in Building 5, Elevator 1 in Building 15, Elevator 1 in Building 17, Elevator 1 in Building 84 and Elevators 1 and 2 in Building 86, incorporating simplex or duplex operation as indicated in the project documents. Additionally, the Building 5 freight elevator, which has a new Virginia Controls controller, will be incorporated as part of the project. This is the only work on elevator 6 within the project. The Liftnet system software that was installed in Phase 1 is resident on the Owner's Office of Information Technology Virtual Servers, in a Web-based deployment. All the hardware and software necessary to interface each individual controller to a network Cat6a connection, also installed as part of the project, will be provided and installed as part of the project. The elevator systems must meet all the capabilities to fully interface to Liftnet without the use of translator equipment, "black boxes", or third party software.

Energy Savings Analysis:
As part of the submittals for each elevator, the elevator supplier and installer will perform a comparative energy analysis to calculate the annual savings in electrical demand and energy, including regeneration, resulting from the

installation of the new elevator; as compared to the existing system. The calculations will be based on elevator industry standards and practices for such calculations, and will be reviewed and approved by the Engineer.

Asbestos Containing Material (ACM):
There is no known asbestos in the elevator shaft or elevator rooms. If any exposed suspect material is encountered which could be damaged by the work, work will stop in the area of concern and the Owner will be notified to allow appropriate verification. If ACM is found to be conflicting with the project work. Corrective action of any discovered ACM will be by a third party under separate contract to the Owner. All of the elevator cab and hatch doors are presumed to be ACM and their seal will be kept intact during removal and delivered to the Owner, at a location to be determined,

Construction Implementation:
The Contractor will submit a detailed project schedule prior to the start of work, for review and approval. The Contractor will follow the approved project schedule and will only modify it on the written approval of the Owner and Engineer. Contractor will submit an up-to-date progress schedule, indicating progress relative to the approved schedule, every two weeks, with each pay application, or at the Owner's request. In the event the Contractor falls behind schedule as indicated in the project conditions, plans for returning to the schedule will be submitted, for approval, to the Engineer.

When elevators are taken out of service for renovation, the hatchway doors on each floor must be secured, barricaded, and clearly placarded as out of service; until acceptance and handover back to the Owner for resumption of normal service.

An elevator may be used for moving materials only after it is taken out of service for renovation under the project. The elevator will be made safe from public operation during such use. The use of the elevator for this purpose may not interfere with the operation of the facility. Should the Owner deem such interference exists, the project will be required to use the out of service elevator during off-hours, evenings, or weekends. The use of the elevator as a material lift will follow all the operational and capacity restrictions applicable to its use. The bidder is responsible for any damage to the facility related to such use.

If a dumpster is used for the on campus work, an area will be designated at a location to be determined on the campus (likely in the courtyard between Buildings 5, 6, and 7) which would also be used as a laydown area. Such an area must have 6 foot high chain link fence with privacy slats or green netting, gate, and be secured at all times. At least three job boxes can be accommodated on the 11th floor of Building 5, but Buildings 15 and 17 have little available tool or lay down space.

Contractors are encouraged to pool for parking on campus. Accommodations to park 2 vehicles can likely be made by parking them in Owner designated spaces on California Avenue. All others will be forced to park off-site or at meters available to the public. During Legislative sessions, parking will likely be limited to one vehicle.

At Buildings 84 and 86, there is little interior laydown space available so provisions must be made to stage in material as needed. Up to 2 parking spaces may be available for laydown and parking, otherwise arrangements must be made for parking off site.

Site Security:
Contractor will maintain the site in a secure manner and follow the Owner's requirements for access and security for all personnel.

CODES APPLICABLE To the PROJECT
Work performed on the project is to be performed under best industry practices and the following codes:

ANSI/ASME A17.1-3 – Safety Code for Elevator – Current WV Adoption
ANSI/ICC A117.1 – Accessibility Standards – Current WV Adoption
NFPA 101 - Life Safety Code - 2018
NFPA 70 - National Electric Code - 2017
NFPA 72 - Nation Fire Alarm Code - 2016
IBC - International Building Code - 2015
IMC - International Mechanical Code - 2015
IPC - International Plumbing Code - 2015
IECC – International Energy Conservation Code - 2009
IFGC - International Fuel Gas Code – 2015

SPECIAL NOTE: "Comply with all ASME A17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions and must be non-proprietary. Review in detail prior to bidding."

End of Summary/ Narrative Scope of Work

SECTION 01 1001

OWNER'S ADDITIONAL REQUIREMENTS

PART 1 GENERAL

1.01 ADMINISTRATIVE REQUIREMENTS

A. Additional Project Requirements:
   1. The material attached to this section are applicable to the project in their entirety.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 OWNER REQUIREMENTS

A. Execute the project in compliance with the additonal requirements following this section.

B. Prior to beginning any work covered by the Contract, vendor shall have read, reviewed, and acknowledged in writing the attached Jobsite Safety Handbook.

END OF SECTION

Jobsite Safety Handbook

For Contractors

Department of Administration (DOA)

General Services Division (GSD)

218 California Avenue
Charleston, WV

THIS HANDBOOK IS TO BE POSTED IN A VISIBLE AREA AT ALL CONSTRUCTION PROJECTS AND/OR CONTRACTOR WORKSITES

Contractor Contact: _____ Phone #: _____

EMERGENCY CONTACTS:

Project Manager:

Name: _____ Phone #: _____

Emergency Services #: _____

GSD Safety Section:

1900 Kanawha Boulevard East, Bldg 1 Room MB12 Charleston, WV 25305

Jonathan Trout: Work# 304 352-5522 Cell# 304-205-2721

Marsha Bowling Work# 304-352-5523 Cell# 304-951-1410

Revision 4/18/22

TABLE OF CONTENTS

Jobsite Safety Handbook

JOBSITE SAFETY HANDBOOK

The following is a summary of applicable jobsite safety requirements. This handbook is intended to be used as a guide and in no way reflects all applicable safety requirements. All employees are responsible for ensuring a safe working environment. All hazards must be addressed regardless if they have been addressed in this handbook. All contractors working on GSD projects are required to follow OSHA regulations.

GSD safety and health procedures are available for review 24/7 in the Main Capitol Building basement, MB-12.

1. BUILDING ALARMS

In the event of a fire, sound the alarm and/or notify other building occupants immediately. Contractor personnel shall respond appropriately to all alarms by exiting the building immediately and remaining at least 50 feet from the building to allow for emergency response access.

2. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Workers must use personal protective equipment, such as:

- Hard hats when overhead, falling or flying hazards exist;
- Safety glasses or face shields for welding, cutting, nailing (including pneumatic), or when working with concrete and/or harmful chemicals;
- Proper shoes or boots to lessen slipping hazards and prevent toe crushing and nail punctures;
- Safety belts and/or harness systems for fall protection.

3. HOUSEKEEPING AND ACCESS AROUND SITE

- Keep all walkways and stairways clear of trash/debris and other materials such as tools and supplies to prevent tripping.
- Keep boxes, scrap lumber and other materials picked up and put in a dumpster or trash/debris area to prevent fire and tripping hazards.
- Provide enough light to allow workers to see and to prevent accidents.

4. STAIRS AND LADDERS

- All stairs are to be equipped with standard handrails.
- Keep ladders in good condition and free of defects – Do not use job made ladders.
- Inspect ladders before use for broken rungs or other defects so falls don't happen. Discard defective ladders.
- Secure ladders at the top and brace or tie off at the bottom to prevent them from slipping and causing falls.

5. SCAFFOLDS AND OTHER WORK PLATFORMS

Scaffolding is to be assembled and used according to OSHA regulations.

General scaffolding guidance:

- Provide ladders or stairs to access scaffold and work platforms safely.
- Keep scaffolds and work platforms free of debris. Keep tools and materials as neat as possible on scaffolds and platforms. This will help prevent materials from falling and workers from tripping.
- Erect scaffolds on firm and level foundations.
- Scaffold legs must be placed on firm footing and secured from movement or tipping, especially on dirt or similar surfaces (a good foundation is a must).
- Erecting and dismantling scaffolds must be under the supervision of a Competent Person.
- The competent person must inspect scaffolds before each use.
- Don't use blocks, bricks, or pieces of lumber to level or stabilize the footings. Manufactured base plates or "mud sills" made of hardwood or equivalent can be used.

Planking:

- Fully plank or use manufactured decking to provide a full work platform on scaffolds. The platform decking and/or scaffold planks must be scaffold grade and not have any visible defects.
- Extend planks or decking material at least 6' over the edge or cleat them to prevent movement. The work platform or planks must not extend more than 12" beyond the end supports to prevent tipping when stepping or working.
- Be sure that manufactured scaffolds are the proper size and that the end hooks are attached to the scaffold frame.

Guardrails:

- Guard scaffold platforms that are more than 10 feet above the ground or floor surface must have a standard guardrail. If guardrails are not practical, use other fall protection devices such as safety belts/harnesses and lanyards.
- Place the top rail approximately 42" above the work platform or planking, with a mid-rail about half that high at 21".
- Install toe boards when other workers are below the scaffold.

6. FALL PROTECTION

OSHA has specific and detailed requirements for fall protection – refer to 29 CFR 1926 Subpart M, 29 CFR 1910, 29 CFR Subpart I. A few of those requirements are listed below:

Guarding:

- Install guardrails around open floors and walls when the fall distance is 4’ or more. The top rail must withstand a 200 lb load.
- Construct guardrails with a top rail approximately 42” high with a midrail about half that high at 21”.
- Install toe boards when other workers are below the work area.
- Cover floor openings larger than 2x2 (inches) with material to safely support the working load.
- Use other fall protection systems like personal fall arrest systems (harness & lanyard), slide guards, roof anchors or alternative safe work practices when a guardrail system cannot be used. Only wear proper shoes or footwear to lessen slipping hazards.
- Train workers on safe work practices before performing work on foundation walls, roofs, trusses, or where performing exterior wall erections and floor installations.
- Flagging systems can be used, where appropriate. Flagging systems must comply with OSHA guidance.

7. EXCAVATION AND TRENCHING

Refer to OSHA regulations for excavation and trenching requirements, along with regulations for walking and working surfaces: 29 CFR 1926 Subpart P, 29 CFR 1910 Subpart D

Some of the Excavation and Trenching requirements are listed below:

- Find the location of all underground utilities by contacting West Virginia 811 before digging. Dial 811 or 800-245-4848.
- Keep workers away from digging equipment and never allow workers in an excavation when equipment is in use.
- Keep workers from getting between equipment in use and other obstacles and machinery that can cause crushing hazards.
- Keep equipment and the excavated dirt back 2 feet from the edge of the excavation.
- Have a competent person conduct daily inspections and correct any hazards before workers enter a trench or excavation.
- Provide workers a way to get into and out of a trench or excavation. Ladders and ramps can be used and must be within 25’ of the worker.
- For excavations and utility trenches over 5 feet deep, use shoring (trench boxes), benching, or slope back the sides. Unless soil analysis has been completed, the earth’s slope must be at least 1-1/2 horizontal to 1 vertical
- Keep water out of trenches with a pump or drainage system, and inspect the area for soil movement and potential cave-ins.
- Open ditches more than 24 hours or overnight must have fence protection.
- Keep drivers in the cab and workers away when dirt and other debris are being loaded into dump trucks. Workers must never be allowed under any load and must stay clear of the back of vehicles.

8. TOOLS AND EQUIPMENT

- Maintain all hand tools and equipment in safe condition and check regularly for defects. Broken or damaged tools and equipment must be removed from the jobsite.
- Use double insulated tools, or ensure the tools are grounded (check for ground plug).
- Equip all power saws (circular, skill, table, etc) with blade guards. Saws must be turned off when unattended. Unplug all power tools when not in use.
- Make sure cords are not damaged. The outer insulation must not be cut or damaged.
- Pneumatic and powder-actuated tools must only be used by trained and experienced personnel. Require proper eye protection for workers.
- Never leave cartridges for pneumatic or powder-actuated tools unattended. Keep equipment in a safe place, according to manufacturer's instructions.

9. VEHICLES AND MOBILE EQUIPMENT

- Inform workers verbally and provide training to stay clear of backing and turning vehicles and equipment with rotating cabs.
- Maintain back-up alarms for equipment with limited rear view or use someone to help guide them back.
- Verify experience or provide training to crane and heavy equipment operators.
- Maintain at least 10 foot clearance from overhead power lines when operating equipment.
- Block up the raised bed when inspecting or repairing dump trucks.
- Use a tag line to control materials moved by a crane.

10. ELECTRICAL

- Prohibit work on new and existing energized (hot) electrical circuits until all power is shut off and a positive "Lockout/Tagout System" is in place.
- Maintain all electrical tools and equipment in safe condition and check regularly for defects.
- Broken or damaged tools and equipment must be removed from the jobsite.
- Protect all temporary power (including extension cords) with Ground Fault Circuit Interrupters (GFCI's). Plug into a GFCI protected temporary power pole, a GFCI protected generator, or use a GFCI extension cord to protect against shocks.
- Locate and identify overhead electrical power lines. Make sure that ladders, scaffolds, equipment or materials never come within 10 feet of electrical power lines.
- Exterior electrical must be approved (UL, NEMA, etc) for exterior use (no internal junction boxes).

11. FIRE PREVENTION

- Provide fire extinguishers near all welding, soldering or other ignition sources.
- Avoid spraying of paint, solvents or other types of flammable materials in rooms with poor ventilation. Build up of fumes and vapors can cause explosions or fires.
- Store gasoline and other flammable materials in a safety can outdoors or in an approved storage facility. (Metal cans with self-sealing lids).

12. CHEMICAL HAZARDS

All hazardous chemicals present in the workplace must have an up-to-date Material Safety Data Sheet (MSDS). All contractors shall maintain MSDS for chemicals used or stored at GSD facilities. All warnings and directions for use must be followed.

13. CONFINED SPACES

By definition, a **confined space**:

- Is large enough for an employee to enter fully and perform assigned work;
- Is not designed for continuous occupancy by the employee; and
- Has a limited or restricted means of entry or exit.

These spaces may include underground vaults, tanks, storage bins, pits and diked areas, vessels, silos and other similar areas.

By definition, a **permit-required confined space** has one or more of these characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material with the potential to engulf someone who enters the space;
- Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section; and/or
- Contains any other recognized serious safety or health hazards.

Entry into confined spaces without an evaluation is forbidden. Entry into permit-required confined spaces requires compliance with all OSHA requirements. Entry into non-permit spaces will require an evaluation by GSD Safety to confirm that conditions remain non-permit required.

Contractors that perform confined space entry activities are required to comply with OSHA regulations. GSD will not provide confined space rescue equipment.

14. LOCK-OUT/TAG-OUT

Before working on, repairing, adjusting or replacing equipment and machinery, all appropriate safety procedures, including lockout/tagout, must be utilized to place the machinery or equipment in a neutral or zero mechanical state.

Outside contractors are expected to have knowledge of lock-out/tag-out requirements.

Contractor Acknowledgement:

I, the undersigned, have read, reviewed and acknowledge my understanding of the General Services Division safety requirements, as set forth in this handbook. I am also aware that all applicable rules and regulations are to be followed, regardless of whether they are specifically mentioned in this handbook.

Contractor Representative (Print Name): _____

Contractor Representative Signature: _____ Date: _____

This signed acknowledgement must be signed and returned to the GSD Safety Section prior to start of project work.

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - AIA General Conditions (AIA A201-2017) & Contract Forms: Additional requirements for progress payments, final payment, changes in the Work.

B. Section 00 7300 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit for Change Orders.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement (Contract).

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values in duplicate within 15 days after Notice to Proceed.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.

E. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement (Contract).

B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement (Contract).

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
   1. Only products stored on the job site can be billed against on the application for payment.

G. Submit one electronic and three hard-copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Engineer will issue instructions directly to Contractor.

B. For other required changes, Engineer will issue a document requesting a change order price with appropriate backup. Answers to requests for information (RFI) do not necessarily constitute a change order request.

C. Computation of Change in Contract Amount: As specified in the Agreement (Contract) and Conditions of the Contract.

D. Substantiation of Costs: Provide full information required for evaluation, per the Contract.
   1. Provide following data:
      a. Quantities of products, labor, and equipment.
      b. Overhead and profit.
      c. Justification for any change in Contract Time.
      d. Credit for deletions from Contract, similarly documented.
   2. Support each request for additional costs with additional information, as required by the Contract, and:
      a. Provide the following data:
         1) Origin and date of claim.
         2) Dates and times work was performed, and by whom.
         3) Time records and wage rates paid.
         4) Invoices and receipts for products, equipment, and subcontracts, similarly documented.

E. Execution of Change Orders: Architect (Engineer) will issue Change Orders (AIA G701) for signatures of parties as provided in the Conditions of the Contract. Agency will submit Change Order requests to the State Purchasing Division for final approval.

F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

H. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 7000.

END OF SECTION

SECTION 01 2500

SUBSTITUTION PROCEDURES (POST AWARD)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions after award of the Contract.

1.02 RELATED REQUIREMENTS

A. State of West Virginia's Purchasing's RFQ: Requirements by the Owner regarding Contractor substitution requests during bidding.

B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

C. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. Substitutions for Cause: Proposed requests which are for a reason demonstrated to be beyond the control of the Contractor.

B. Substitutions for Convenience of the Contractor: Proposed requests offering advantages solely to the Contractor with no significant demonstration of benefit to the Owner.

C. Substitutions for Convenience of the Owner: Proposed requests for substitution which the Contractor demonstrate that such a substitution benefits the Owner in regards to either schedule, cost, or improved function.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to any other work or trade that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect (Engineer) for review or redesign services associated with re-approval by authorities.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

C. Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
   1. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   2. Substitution request is fully documented and properly submitted.
   3. Requested substitution will not adversely affect Contractor's construction schedule.
   4. Requested substitution has received necessary approvals of authorities having jurisdiction.
   5. Requested substitution is compatible with other portions of the Work.
   6. Requested substitution has been coordinated with other portions of the Work.
   7. Requested substitution provides specified warranty.

8. 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.

D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.

E. Limit each request to a single proposed substitution item. Each request to be submitted with an associated bid question for tracking purposes.
   1. Submit an electronic document, combining the request form with supporting data into single document. Confirm receipt of document with Engineer. Deliver physical samples to agreed upon location where required for material and finish review.
   2. Deliver physical samples to agreed upon location where required for material and finish review.

3.02 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Substitutions for Cause: WIll be considered but such consideration is no guarantee of acceptance.

B. Substitutions for Contractor Convenience: Substitutions solely for the Convenience of the Contractor will not be accepted.

C. Substitutions for Owner Convenience: Contractor must demonstrate, and Owner must concur, that subsitution benefits the Owner in regards to either schedule, cost or improved function.

3.03 RESOLUTION

A. Architect (Engineer) may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. A rejected submittal due to lack of compliance with contract requirements shall not be permitted to be resubmitted. Successive requests for the same product will not be entertained.

C. After bidding, Engineer will notify Contractor in writing of decision to accept or reject request. Judgement of the Engineer shall be final. A rejected submittal due to lack of information or compliance with contract requirements shall not be permitted to be resubmitted.

3.04 ACCEPTANCE

A. Accepted substitutions are a contractual change to the Project. They will be documented and incorporated into work of the project. Accepted Substitutions which would result in a change to Contract Sum or Contract Time must be approved by Change Order.

END OF SECTION

SECTION 01 3000

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Site mobilization meeting.

C. Progress meetings.

D. Construction progress schedule.

E. Submittals for review, information, and project closeout.

F. Number of copies of submittals.

G. Requests for Interpretation (RFI) procedures.

H. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 00 7200 - AIA General Conditions (AIA A201-2017) & Contract Forms: Dates for applications for payment

B. Section 01 6000 - Product Requirements: General product requirements.

1.03 PROJECT COORDINATOR

A. Project Coordinator: General Services Division's Owner's Representivie.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for contractor access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Engineer through the Project Coordinator:
   1. Requests for Interpretation.
   2. Shop drawings, product data, and samples.
   3. Test and inspection reports.
   4. Design data.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.
   9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect (Engineer).
   3. Contractor.

C. Agenda:
   1. Submission of full list of subcontractors, list of products, schedule of values, and progress schedule.
   2. Designation of personnel representing the parties to Contract, Owner, and Architect (Engineer).
   3. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   4. Scheduling.

D. Record minutes and distribute copies within two days after meeting to Engineer for review and approval. Once approved snend to participants, with two copies to Architect (Engineer), Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

A. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Contractor's superintendent.
   4. Major subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   6. Security and housekeeping procedures.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   10. Procedures for maintaining record documents.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect (Engineer), Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Contractor to make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect (Engineer).
   4. Contractor's superintendent.
   5. Major subcontractors.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.

9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to work.

D. Engineer to prepare meeting minutes for distribution.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date Notice to Proceed, submit preliminary schedule.

B. If preliminary schedule requires revision after review, submit revised schedule within 5 days.

C. Within 10 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 5 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.05 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Prior Notification: Prio to preparing an RFI, notify Engineer by phone to discuss concern.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response.

a. The Owner will make the determination of such frivolous RFIs and reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect (Engineer), and any of its consultants, due to processing of such RFIs, without appeal.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Discrete and consecutive RFI number, and descriptive subject/title.
   3. Reference to particular Contract Document(s), sheet number, spec page, ect. requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   4. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   5. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. Review Time: Architect (Engineer) will respond and return RFIs to Contractor within fourteen calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect (Engineer) within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.06 SUBMITTAL SCHEDULE

A. Submit to Architect (Engineer) for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, role and name of subcontractor, and unique sequential submittal number..
   5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.07 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

E. Submittals for review may be delayed by complexity of submittal.

3.08 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect (Engineer)/Engineer. No drawing originally in 11 x 17 will be submitted in a size smaller than 11 x 17.
   2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect (Engineer)/Engineer.
   3. Documents may be scanned and returned by the Architect (Engineer) on contractors request but the originals on file are the reference materials for the project.

B. Documents for Information: Submit two copies.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Engineer

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

A. General Requirements:
   1. A List of Submittals for the project will be submitted within 10 days of Notice to Proceed.
   2. Use a single transmittal for related items.
   3. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   4. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by Architect (Engineer).
   5. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   6. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   7. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   8. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Deliver submittals to Architect (Engineer) at business address.
         1) Provide 1 copy for Engineer's record plus number of copies required by the Contractor for return.
            (a) The elevator submittal requires 2 paper copies to the Engineer and 2 paper copies to the Elevator Consultant in addition to the Contractor return copies.
         2) Submit an electronic copy concurrent with delivery of paper copies.
   9. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect (Engineer)'s consultants, Owner, or another affected party, allow an additional 7 days.
      c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect (Engineer)'s approval, allow an additional 30 days.
      d. Some submittals may take longer to review due to their complexity, items beyond the control of the design team, or missing information/ disorganization.
   10. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   11. Provide space for Contractor and Architect (Engineer) review stamps.
   12. When revised for resubmission, identify all changes made since previous submission.
   13. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   14. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.

2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.12 SUBMITTAL REVIEW

A. Submittals for Review: Architect (Engineer) will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect (Engineer) will acknowledge receipt and review. See below for actions to be taken.

C. Architect (Engineer)'s actions will be reflected by marking each returned submittal using actual stamp on hard copies of submittals. Electronic scan will be returned upon completion of review and Contractor's required return copies will be mailed or hand-delivered at the next progress meeting.

D. Architect (Engineer)'s and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "No Exceptions Taken".
b. "See Exceptions Noted".
1) Exceptions may call for re-submission of a part of the original submittal, or for additional information, prior to release, to allow some part of the submittal to proceed to purchasing or fabricatiom, to benefit the project schedule.
2. Not Authorizing fabrication, delivery, and installation:
a. "Revise and Resubmit".
1) Resubmit revised item, with review notations acknowledged and incorporated.
2) Non-responsive resubmittals may be rejected.
3) Resubmisstions are limited to oone attempt to re-submit. the Owner may asses additional Architectural or Enginering fees on and time and materials basis, for successive submittals, without appeal.
b. "Not Approved".
1) Submit item complying with requirements of Contract Documents.

E. Architect (Engineer)'s and consultants' actions on items submitted for information:
1. Items for which no action was taken:
a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Mock-ups.

G. Manufacturers' field services.

H. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

B. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing; 2014a.

B. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect (Engineer), in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect (Engineer).

C. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

1.06 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect (Engineer) before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect (Engineer) shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Contractor shall employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 3 EXECUTION

2.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect (Engineer) before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 MOCK-UPS

A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect (Engineer) and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect (Engineer).

2.03 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect (Engineer) and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect (Engineer) and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect (Engineer).
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4. Notify Architect (Engineer) and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect (Engineer).

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

2.05 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the work, Engineer will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary sanitary facilities.

B. Temporary Controls: Barriers and enclosures.

C. Security requirements.

D. Vehicular access and parking.

E. Waste removal facilities and services.

1.02 TEMPORARY UTILITIES

A. Owner will provide the following:
   1. Electrical power and metering, consisting of connection to existing facilities.
   2. Water supply, consisting of connection to existing facilities.

B. Existing facilities may be used.

C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TEMPORARY SANITARY FACILITIES

A. Use of existing facilities is permitted.

B. Maintain daily in clean and sanitary condition. Failure to do so may result in requirement for job site portable toilets.

C. At end of construction, return facilities to same or better condition as originally found.

1.04 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.05 INTERIOR ENCLOSURES

A. Provide temporary partitions to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
   1. No attachments to existing surfaces will be allowed.

1.06 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

1.07 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide off-site parking for employees.

1. Parking may be available at Laidley Field. Inquire with campus parking office for permit availability and cost.

D. Do not allow vehicle parking on existing pavement.

E. Coordinate delivery of materials with the Owner for access to loading docks.

1.08 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
1. Provide seeding as necessary.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Lists of products to be removed from existing building.

B. Section 01 2500 - Substitution Procedures (Post Award): Substitutions made during procurement and/or construction phases.

1.03 REFERENCE STANDARDS

A. NEMA MG 1 - Motors and Generators; 2014.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
   1. Any submittals that list multiple products without properly identifying the part number, model, etc. used for this specific project will be rejected.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
   1. See Section 01 1000 and construction documents for list of items required to be salvaged for reuse and relocation.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1. Made using or containing CFC's or HCFC's.
   2. Containing lead, cadmium, or asbestos.

C. Where other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions
   2. If wet-applied, have lower VOC content
      a. Have longer documented life span under normal use.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 2500 - Substitution Procedures (Post Award).

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

D. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.
      d. Description of proposed work and products to be used.
      e. Effect on work of Owner or separate Contractor.
      f. Written permission of affected separate Contractor.
      g. Date and time work will be executed.

C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
   2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 6 pm to 7 am.
   3. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached. Attachment to existing substrates is only allowed to facilitate elevator equipment. No attachments to architectural features arre allowed.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Engineer 14 days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Engineer before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
    a. Notify owner one week prior to all disruptions.
    b. Disable existing systems only to make switchovers and connections; minimize duration of outages.
    c. All disruptions must be approved by owner.
    d. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Engineer and Owner 14 days prior to start-up of major systems and equipment.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. Where required in specific Sections, Engineer will witness start-up of designated systems and equipment.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

H. Demonstration and instruction will be witnessed by the Engineer. Notify Engineer and Owner 14 days prior.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Engineer.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Engineer when work is considered ready for Substantial Completion.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect (Engineer)'s Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect (Engineer)'s and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect (Engineer).

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Engineer when work is considered finally complete.

H. Complete items of work determined by Architect (Engineer) listed in executed Certificate of Substantial Completion.

I. Complete items of work determined by Engineer's final inspection.

3.14 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7800

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect (Engineer) with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect (Engineer) will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit two copy(ies) of completed documents 15 days prior to final inspection. These copies will be reviewed and returned with comments, if necessary. Revise as required and redistribute to all parties.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 3 EXECUTION

2.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   2. Field changes of dimension and detail.
   3. Details not on original Contract drawings.

2.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

2.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Additional Requirements: As specified in individual product specification sections.

2.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect (Engineer), Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Operation and maintenance data.
      c. Field quality control data.
      d. Photocopies of warranties and bonds.

K. Provide (1) electronic copy of close-out documentation.

2.05 WARRANTIES

A. Obtain warranties, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties until time specified for submittal.

END OF SECTION

SECTION 01 7900

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Electrical systems and equipment.
   4. Conveying systems.
   5. Fire Alarm and Security Systems.
   6. Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.

B. Section 01 9113 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   1. Submit one copy to the Engineer, not to be returned.
   2. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect (Engineer) for transmittal to Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
   1. Format: DVD Disc.

2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. All demonstration must be completed, to the satisfaction of the Engineer, prior to the scheduling of training.

B. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Training will not be conducted until the O&M manuals have been reviewed and approved. the O&M manuals will be an integral part of the training. provide a set of O&M, above the required number of closeout sets, for each two persons attending training.

B. Contractor will prepare the Training Plan based on draft plans submitted.

C. Conduct training on-site unless otherwise indicated.

D. Owner will provide classroom and seating at no cost to Contractor.

E. Provide training in minimum two hour segments.

F. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

G. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.

H. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.

3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

I. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.

C. Concrete curing.

1.02 REFERENCE STANDARDS

A. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

F. ACI 308R - Guide to External Curing of Concrete; 2016.

G. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2018).

H. ACI 347R - Guide to Formwork for Concrete; 2014, with Errata (2017).

I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.

J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2020.

M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2020.

N. ASTM C150/C150M - Standard Specification for Portland Cement; 2019a.

O. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

P. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019.

Q. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2019.

R. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.

S. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.

2.02 REINFORCEMENT MATERIALS

A. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: 4 x 8-W6 x W10.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C33/C33M.

C. Fly Ash: ASTM C618, Class C or F.

D. Calcined Pozzolan: ASTM C618, Class N.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

2.04 CONCRETE MIX DESIGN

A. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum 40 percent by weight.
   6. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
   7. Maximum Slump: 3 inches.
   8. Maximum Aggregate Size: 5/8 inch.

2.05 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

3.04 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.05 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.06 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

END OF SECTION

SECTION 05 5133

METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prefabricated ladders.

1.02 REFERENCE STANDARDS

A. 29 CFR 1910.23 - Ladders; current edition.

B. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2018.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014, with Editorial Revision (2017).

E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

H. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata.

I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.

J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

K. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.

C. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

D. Designer's Qualification Statement.

1.04 QUALITY ASSURANCE

A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Bolts, Nuts, and Washers: ASTM A307, plain.

E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Carbon steel; ASTM A1011/A1011M, Grade 36, minimum.
   3. Finish: Powder coat; color to be selected by Architect (Engineer) from manufacturer's standard range.
   4. Manufacturers:
      a. Substitutions: See Section 01 6000 - Product Requirements.

2.04 FINISHES - STEEL

A. Prime paint steel items.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

B. Supply setting templates to the appropriate entities for steel items required to be embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping of joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2018c.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

C. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2015b, with Editorial Revision (2016).

D. ITS (DIR) - Directory of Listed Products; current edition.

E. FM 4991 - Approval Standard for Firestop Contractors; 2013.

F. FM (AG) - FM Approval Guide; current edition.

G. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

H. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

I. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

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

1.04 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Firestopping Materials: Caulk or putty. Meeting requirements of WVSFM

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

C. Fire Ratings: Refer to drawings for required systems and ratings.

2.02 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of

penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Engineer reserves the right to inspect all firestopping.

D. Install labeling required by code.

E. Maintain log of all fire stopping material used and locations. Submit log at close-out. Include labels & cut sheets of each material used by all trades for review by Fire Marshal. Bind log in O&M manuals.

3.04 FIELD QUALITY CONTROL

A. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9200

JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.

B. ASTM C834 - Standard Specification for Latex Sealants; 2017.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2018.

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.

H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019.

I. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which laboratory adhesion and/or compatibility testing is required.
   6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

F. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

1.04 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.

2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver to manufacturer sufficient samples for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

C. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
1. Identification of testing agency.
2. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
a. Test date.
b. Copy of test method documents.
c. Age of sealant upon date of testing.
d. Test results, modeled after the sample form in the test method document.
e. Indicate use of photographic record of test.

D. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Have a copy of the test method document available during tests.
3. Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
4. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
5. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
6. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
7. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect (Engineer).

E. Perform Field and Laboratory testing on both types of sealant specified for all substrates. Final selection of product will be contengent on the test results.

F. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
1. Sample: At least 18 inches long.
2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
1. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
a. Joints between door, window, and other frames and adjacent construction.
b. Other joints indicated below.
2. Do not seal the following types of joints.
a. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.

b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
c. Joints where installation of sealant is specified in another section.
d. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.

D. Interior Wet Areas: Bathrooms and kitchens; fixtures in wet areas include plumbing fixtures, countertops, and other similar items.

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168 and per EPA airPLUS program for interior locations.

2.03 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: To be selected by Architect (Engineer) from manufacturer's standard range.
5. Cure Type: Single-component, neutral moisture curing.

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: White.

C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect (Engineer) from manufacturer's standard range.
2. Basis-of-Design:
a. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.

D. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.

1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
2. Notify Architect (Engineer) of date and time that tests will be performed, at least seven days in advance.
3. Record each test on Preinstallation Adhesion Test Log as indicated.
4. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect (Engineer).
5. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire-rated hollow metal doors and frames.

1.02 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. NAAMM: National Association of Architectural Metal Manufacturers.

D. SDI: Steel Door Institute.

E. UL: Underwriters Laboratories.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.

J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

K. ITS (DIR) - Directory of Listed Products; current edition.

L. NAAMM HMMA 805 - Recommended Selection and Usage Guide for Hollow Metal Doors and Frames; 2012.

M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

O. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2007.

P. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.

R. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2017.

S. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

T. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

U. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

1.05 QUALITY ASSURANCE

A. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.02 HOLLOW METAL DOORS

A. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.
   4. Door Thickness: 1-3/4 inches, nominal.

2.03 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Door Frames, Fire-Rated: Knock-down type.
   1. Fire Rating: Same as door, labeled.

C. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

2.04 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
   1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.05 ACCESSORIES

A. Door Window Frames: Door window frames with glazing securely fastened within door opening.

B. Glazing: As specified in Section 08 8000.

C. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

B. Verify locations of anchors and provide blocking as necessary between brick and block wythes.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 7100.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

E. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 23 3300 - Air Duct Accessories: Access doors in ductwork.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units:
   1. Location: at mechanical, electrical, and plumbing devices located within walls that require access.
   2. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.

2.02 WALL-MOUNTED UNITS

A. Wall and Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Material: Steel.
   2. Door Style: Single thickness with rolled or turned in edges.
   3. Frames: 16 gage, 0.0598 inch, minimum thickness.
   4. Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
   5. Hardware:
      a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
      b. Latch/Lock: Screw driver slot for quarter turn cam latch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

3.03 SCHEDULE

A. Provide access hatches where required for mechanical, electrical, and plumbing device access as follows:
   1. One-handed Operation: 10”x10”
   2. Two-handed Operation: 18”x18”
   3. Head plus hands Operation: 24”x24”
   4. Body Access, inluding one location at each bathroom chase space: 36”x36”

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:

a. Swinging doors.

2. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
2. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.

1.03 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule

2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:

1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated, and tagged with full description for coordination with schedule.

    a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

3. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

    a. Door Index; include door number, heading number, and Architects hardware set number.
    b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
    c. Quantity, type, style, function, size, and finish of each hardware item.
    d. Name and manufacturer of each item.
    e. Fastenings and other pertinent information.
    f. Location of each hardware set cross-referenced to indications on Drawings.
    g. Explanation of all abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for hardware.
    i. Door and frame sizes and materials.
    j. Name and phone number for local manufacturer's representative for each product.

4. Key Schedule:

    a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.

b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
    1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

f. Prepare key schedule by or under supervision of supplier, detailing Owner’s final keying instructions for locks.

5. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product data for electrified door hardware:

a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Factory order acknowledgement numbers (for warranty and service)
d. Name, address, and phone number of local representative for each manufacturer.
e. Parts list for each product.
f. Final approved hardware schedule, edited to reflect conditions as-installed.
g. Final keying schedule
h. Copies of floor plans with keying nomenclature
i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

A. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

1. Warehousing Facilities: In Project's vicinity.

2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

    a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:

1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC).
2. Can provide installation and technical data to Architect and other related subcontractors.
3. Can inspect and verify components are in working order upon completion of installation.
4. Capable of producing wiring diagrams.
5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

F. Keying Conference

1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

    a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    b. Preliminary key system schematic diagram.
    c. Requirements for key control system.
    d. Requirements for access control.
    e. Address for delivery of keys.

G. Pre-installation Conference

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.

5. Review required testing, inspecting, and certifying procedures.

H. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

F. Deliver keys to Owner by registered mail or overnight package service.

1.07 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying with Owner's security consultant.

1.08 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Beginning from date of Substantial Completion, for durations indicated.

a. Closers:
1) Mechanical: 30 years.

b. Locksets:
1) Mechanical: 3 years.

c. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

A. Maintenance Tools: Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: “No Substitute.”

1. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series.
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series.

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

    a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

    a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:

    a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

    a. Steel Hinges: Steel pins
    b. Non-Ferrous Hinges: Stainless steel pins
    c. Out-Swinging Exterior Doors: Non-removable pins
    d. Out-Swinging Interior Lockable Doors: Non-removable pins
    e. Interior Non-lockable Doors: Non-rising pins

8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
10. Provide mortar guard for each electrified hinge specified.
11. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.04 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage L9000 series.
2. Acceptable Manufacturers and Products: Best 45H series, Sargent 8200 series.

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3 hour fire doors.
2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

    a. Lever Design: Schlage 06A.

2.05 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Medico.

B. Requirements:

1. Provide cylinders/cores to match Owner’s existing Medico key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.

C. Construction Keying:

2.06 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Provide cylinders/cores keyed into Owner's existing factory registered keying system.

C. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

D. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

    a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
3. Provide keys with the following features:

    a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)

4. Identification:

    a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Do not provide blind code marks with actual key cuts.
    b. Identification stamping provisions must be approved by the Architect and Owner.
    c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
    d. Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
    e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

5. Quantity: Furnish in the following quantities.

    a. Change (Day) Keys: 3 per cylinder/core.
    b. Master Keys: 6.

2.07 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4040XP series.
2. Acceptable Manufacturers and Products: Corbin-Russwin DC8000 series, Sargent 281 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 5/8 inch (16 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.08 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:

    a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.09 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson.
2. Acceptable Manufacturers: Rixson, Sargent.

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified.

2.10 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide heavy duty concealed overhead stops.
3. Floor stops shall not be permitted on this project.

2.11 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International.
2. Acceptable Manufacturers: National Guard, Reese.

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Size of thresholds:

    a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
    b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

4. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.12 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Protection Plates: BHMA 630 (US32D)
3. Overhead Stops and Holders: BHMA 630 (US32D)
4. Door Closers: Powder Coat to Match
5. Wall Stops: BHMA 630 (US32D)

EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.

I. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

J. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

K. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

3.03 FIELD QUALITY CONTROL

A. Engage qualified manufacturer trained representative to perform inspections and to prepare inspection reports.

1. Representative will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.04 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.05 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.06 DOOR HARDWARE SCHEDULE

A. Hardware items are referenced in the following hardware. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Sets:

HDW SET # 03

DOOR(S) MARKED:

1 (Building 86)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	ITEMID	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	CYLINDER	AS REQUIRED		626	MED
1	EA	OH STOP	100S		630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	188S-BK		S-Bk	ZER

END OF SECTION

SECTION 09 2116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing.

C. Acoustic insulation.

D. Gypsum wallboard.

E. Joint treatment and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2018.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2019b.

E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2018.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2018.

G. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2019.

H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

J. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 METAL FRAMING MATERIALS

A. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: "C" shaped with knurled or emobossed faces.
   2. Runners: U shaped, sized to match studs.

B. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.

2.02 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    a. Mold resistant board is required at all locations.
3. Thickness:
    a. Vertical Surfaces: 5/8 inch.
    b. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

B. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.

2.03 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
1. Types: As detailed or required for finished appearance.

D. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.

E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center.
1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Blocking: Install wood blocking for support of:
1. Framed openings.
2. Toilet accessories.
3. Wall-mounted door hardware.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2020.

E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Acoustical Panels: Gypsum, with the following characteristics:
   1. Classification: ASTM E1264 Type XX.
   2. Size: 24 by 24 inches.
   3. Thickness: 3/4 inch.
   4. Panel Edge: Square.
   5. Color: White.
   6. Suspension System: Exposed grid.

2.02 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
   1. Materials:
      a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System: Hot-dipped galvanized steel grid with aluminum cap.
   1. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
   2. Profile: Tee; 15/16 inch face width.
   3. Finish: Baked enamel.
   4. Color: White.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12-gage 0.08 inch galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Perimeter Moldings: Same metal and finish as grid.

PART 3 EXECUTION

3.01 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

3.02 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

F. Install hold-down clips on vertical panels.

END OF SECTION

SECTION 09 9123
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

D. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

F. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
   2. MPI product number (e.g., MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Electrostatically Applied Coating: Submit manufacturer's literature including descriptive data and recommendations for mixing, application, and curing.

D. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

1.05 QUALITY ASSURANCE

A. Electrostatically Applied Coating: Provide written certification attesting that applicators have been factory trained, and that application equipment used complies with manufacturer's requirements.

1.06 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide door and frame assembly illustrating paint color, texture, and finish.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
   2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   4. Supply each paint material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Architectural coatings VOC limits of West Virginia.

c. Meeting EPA airPLUS requirements for Low-Emissions Materials.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect (Engineer) from the manufacturer's full line.

E. Colors: To be selected from manufacturer's full range of available colors.
1. Selection to be made by Architect (Engineer) after award of contract.

2.02 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, wood, and shop primed steel.
1. Two top coats and one coat primer.
2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.
3. Top Coat Sheen:
a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
b. Eggshell: MPI gloss level 3; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
1. Medium duty applications include doors, door frames, and railings.
2. Two top coats and one coat primer.
3. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, or 141.
4. Top Coat Sheen:
a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
5. Primer: As recommended by top coat manufacturer for specific substrate.

C. Electrostatically Applied Coating: Provide coatings specifically compounded by manufacturer for electrostatic spray application. Where primers are indicated or required, provide only primers that are approved by manufacturer for use with finish coating materials.
1. Material Quality: Materials which do not display Manufacturer's identification will not be acceptable.
2. Mix, prepare, and store materials according to Manufacturer's latest printed instructions. Manually mix coating materials; power mixing devices are not permitted. Do not add thinner or other agents to coating materials.
3. Color: Provide color as follows:
a. Custom color to match Architect's sample.

2.03 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been adequately prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect (Engineer) of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Electrostatic Applied Coating: Protect work of other trades and adjacent surfaces not scheduled to be coated. Prepare and clean in strict accordance with coating manufacturer's instructions.

F. Electrostatically Applied Coating: Sand, or chemically clean as appropriate, all abraded surfaces, corroded areas and other imperfections in surfaces to be coated. Fill or feather edges of sanded areas to produce for a smooth transition to bare metal.

G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

H. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
   3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

I. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

J. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with tinted primer.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

I. Electrostatically Applied Coating: Apply prime and finish materials in accordance with manufacturer's directions. Apply each material at not less that the manufacturer's recommended spreading rate. Use special equipment, applicators, and techniques recommended by manufacturer's as best suited for the particular applications.

J. Electrostatically Applied Coating: Apply additional coats beyond scheduled requirements when undercoating, stains or other conditions show through final paint coat until the special coating is of uniform finish, color and appearance.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 14 2100
ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 21 1300 - Fire-Suppression Sprinkler Systems.

B. Section 26 0533.13 - Conduit for Electrical Systems: Electrical conduit requirements.

C. Section 26 0583 - Wiring Connections: Wiring connection requirements.

1.02 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. AISC 360 - Specification for Structural Steel Buildings; 2016 (Revised 2021).

C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

D. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices ; 2019, with Errata (2021).

E. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, and Dumbwaiters; 2020.

F. ASME QEI-1 - Standard for the Qualification of Elevator Inspectors; 2018.

G. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

H. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.

I. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

K. ITS (DIR) - Directory of Listed Products; current edition.

L. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.

O. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other installers to provide necessary conduits for proper installation of wiring, including but not limited to, the following:
      a. Elevator equipment devices remote from elevator machine room or hoistway.
      b. Date services for the machine room and ADA video phone systems.
      c. Elevator pit for lighting, sump pump, and Fire alarm/ Fire protection.
      d. Automatic transfer switch from controller cabinet.
      e. Fire alarm panel from controller cabinet.
   2. Coordinate work with other installers for equipment provisions necessary for proper elevator operation, including but not limited to, the following:
      a. Automatic transfer switches with auxiliary contacts for emergency power transfer status indication.

b. Shunt trip devices for automatic disconnection of elevator power prior to fire suppression system activation; include provisions for shunt trip power monitoring.
c. Overcurrent protection devices selected to achieve required selective coordination.

B. Preinstallation Meeting: Convene meeting at least one week prior to start of this work.
1. Review schedule of installation, proper procedures and conditions, and coordination with related work.
2. Review use of elevator for construction purposes, hours of use, scheduling of use, cleanliness of car, employment of operator, and maintenance of system.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit data on following items:
1. Signal and operating fixtures, operating panels, and indicators.
2. Car design, dimensions, layout, and components.
3. Car and hoistway door and frame details.
4. Electrical characteristics and connection requirements.

C. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
2. Hoistway Components: Size and location of car machine beams, guide rails, buffers, ropes, and other components.
3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
4. Individual weight of principal components; load reaction at points of support.
5. Loads on hoisting beams.
6. Clearances and over-travel of car and counterweight.
7. Locations in hoistway and machine room of traveling cables and connections for car lighting, telephone, and fire alarm interface.
8. Location and sizes of hoistway and car doors and frames.
9. Calculated heat dissipation of elevator equipment in machine room.
10. Interface with building security system.
11. Electrical characteristics and connection requirements.
12. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.

D. Samples: Submit samples illustrating car floor material, car interior finishes, car and hoistway door and frame finishes, and handrail material and finish in the form of finish color selection brochures or samples as required by Architect.

E. Manufacturer's Qualification Statement.

F. Installer's Qualification Statement.

G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

I. Operation and Maintenance Data:
1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
2. Operation and maintenance manual.
3. Schematic drawings of equipment, and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each quality standard document on site.

B. Designer Qualifications: Design guide rails under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in West Virginia.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

D. Installer Qualifications: Company specializing in performing work of the type specified and with at least ten years of documented experience.

E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

F. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR) or UL (DIR).

G. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose indicated in construction documents.

PART 2 PRODUCTS

2.01 ELECTRIC TRACTION ELEVATORS

A. As Specified herein.

2.02 COMPONENTS

A. As specified herein.

2.03 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

B. Accessibility Requirements: Comply with ADA Standards.

C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.

D. Comply with seismic design requirements in accordance with ASME A17.1 and authorities having jurisdiction (AHJ).

E. Perform welding of steel in accordance with AWS D1.1/D1.1M.

F. Fabricate and install door and frame assemblies in accordance with NFPA 80 and complying with requirements of authorities having jurisdiction (AHJ).

G. Perform electrical work in accordance with NFPA 70.

H. Comply with fire protection sprinkler system of hoistway design in accordance with NFPA 13 requirements and authorities having jurisdiction (AHJ); see Section 21 1300.

2.04 OPERATION CONTROLS

A. Elevator Controls: Provide landing operating panels, landing indicator panels, and all devices required by project documents and applicable codes and standards..
   1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
   2. Landing Indicator Panels: Illuminating.
   3. Comply with ADA Standards for elevator controls.

B. Interconnect elevator control system with building security, fire alarm, card access, smoke alarm, building management control, and emergency power systems.

C. Door Operation Controls:
   1. Program door control to open doors automatically when car arrives at floor landing.
   2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
   3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.

D. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).

E. Locate Firefighter Emergency Operation Panel in building Fire COmmand Center if so equipped, or otherwise by direction.

2.05 DESTINATION DISPATCH SYSTEM

A. Destination Dispatch System: Elevator system integrated with building's security and access control systems to verify proper admission credentials prior to elevator floor selection. Proivde access coordination for secured floor and functions as directed by Owner.

2.06 OPERATION CONTROL TYPE

A. As Indicated herein:

2.07 SERVICE CONTROL TYPE

A. Independent Service Control:
   1. Provide key operated "Independent Service" on car operating panel. Key activation will remove that car from normal operation and cancel pre-registered car calls.
   2. Car will respond to selected floor. Car will not respond to any calls from landing call buttons. Car will only respond to calls placed on the car operating panel. Doors will remain open at last landing requested. Doors will close with a constant pressure on "Door Close" button.
   3. Key activation to normal operation will return car to normal operation.

2.08 EMERGENCY POWER

A. Set-up elevator operation to run with building emergency power supply when the normal building power supply fails, and in compliance with ASME A17.1 requirements.

B. Building Emergency Power Supply: Supplied by backup generator; provide elevator system components as required for emergency power characteristics with phase rotation the same as for normal power.
   1. Generator is limited source, provide for selective operation of one elevator at a time
   2. Provide transfer switches and auxiliary contacts.
   3. Install connections to power feeders.

C. Emergency Lighting: Comply with ASME A17.1 elevator lighting requirements.

D. Provide operational control circuitry for adapting the change from normal to emergency power.

E. After the transfer of emergency power and advancement of elevators to landings has completed one cycle, operate one pre-selected elevator in normal operation using the emergency power supply.
   1. If the pre-selected car fails to operate, automatically select another car to operate.
   2. Provide manual switches to override the automatic selection process.

2.09 MATERIALS

A. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

2.10 CAR AND HOISTWAY ENTRANCES

A. Elevator, as indicated the project docments.:
   1. Car and Hoistway Entrances, Each Elevator Floor Lobby:
      a. Framed Opening Finish and Material: Alkyd enamel on steel.
      b. Car Door Material: To match hoistway entrance doors, with rigid sandwich panel construction. Except as specified otherwise in project documents.
      c. Hoistway Door Material: To match cab entrance doors, with rigid sandwich panel construction. Except as specified otherwise in project documents.

2.11 CAR EQUIPMENT AND MATERIALS

A. Elevator Car, as specified herein.:

1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, alarm button, and as specified hjerein.
    a. Panel Material: Integral with front return; one per car.
    b. Car Floor Position Indicator: Above door with illuminating position indicators.
    c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
2. Hand and bumper Rail: Stainless steel, at three side walls. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
    a. Stainless Steel Finish: No. 4 Brushed.

2.12 FINISHES

A. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, comply with VOC limitations of authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that hoistway, pit, machine room, and _____ are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of correct characteristics.

3.02 INSTALLATION

A. Coordinate this work with installation of hoistway wall construction.

B. Install system components, and connect equipment to building utilities.

C. Provide conduit, electrical boxes, wiring, and accessories; see Sections 26 0533.13 and 26 0583.

D. Mount machines and motors on vibration and acoustic isolators.
    1. Place on structural supports and bearing plates.
    2. Securely fasten to building supports.
    3. Prevent lateral displacement.

E. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.

F. Install guide rails to allow for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.

H. Bolt or weld brackets directly to structural steel hoistway framing.

I. Field Welds: Chip and clean away oxidation and residue with wire brush; spot prime with two coats.

J. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.

K. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime with two coats.

L. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.

M. Adjust equipment for smooth and quiet operation.

3.03 TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Testing and inspection by regulatory agencies certified in accordance with ASME QEI-1 will be performed at their discretion.
   1. Schedule tests with agencies and notify Owner and Architect (Engineer).
   2. Obtain permits as required to perform tests.
   3. Document regulatory agency tests and inspections in accordance with requirements.
   4. Perform tests required by regulatory agencies.
   5. Furnish test and approval certificates issued by authorities having jurisdiction (AHJ).

C. Perform testing and inspection in accordance with requirements.
   1. Inspectors shall be certified in accordance with ASME QEI-1.
   2. Perform tests in accordance with ASME A17.2.
   3. Provide at least two weeks written notice of date and time of tests and inspections.
   4. Supply instruments and execute specific tests.

D. Operational Tests:
   1. Perform
   2. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
      a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.

3.05 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.

B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.06 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Remove protective coverings from finished surfaces.

C. Clean surfaces and components in accordance with manufacturers written instructions.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals for closeout submittals.

B. See Section 01 7900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

3.08 PROTECTION

A. Do not permit construction traffic within car after cleaning.

B. Protect installed products until Date of Substantial Completion.

C. Touch-up, repair, or replace damaged products and materials before Date of Substantial Completion.

END OF SECTION

SECTION 14 2143

ELECTRIC TRACTION ELEVATOR MODERNIZATION

PART 1 GENERAL

1.01 GENERAL REFERENCE

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

1.02 DESCRIPTION OF WORK

A. This specification relates to the full modernization of existing roped traction elevators. Requirements beyond this section, found elsewhere in the project documents, apply to the the work in this section.

B. Perform all required field engineering surveys and provide all engineering, labor, materials, tools, equipment, transportation, and supervision in order to design, engineer, fabricate and install the elevator plant as shown on the Drawings and listed in these Specification documents, complete in a first class workmanship manner. All work shall be done in accordance with the requirements of all local codes and applicable regulations, which may govern the requirements of this installation.

C. The work to be performed shall include the furnishing and installation of all labor, materials and equipment as hereinafter specified. The Contractor shall provide all work to furnish a complete installation. The apparent silence of the Specifications as to any detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only the best material and workmanship is to be used; and interpretation of these Specifications shall be made upon that basis. The Engineer and the elevator consultant are the final authority on determining compliance to all requirements herein.

1.03 SUMMARY

A. This Section includes electric traction passenger elevators.
   1. Related work include the following:
      a. “Fire Alarm” for smoke detectors in elevator lobbies to initiate emergency recall operation and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation and for connection to elevator controllers.
      b. “Premise Telephone Wiring” for telephone service to elevators.
      c. Mechanical and Plumbing Requirements.
      d. Electrical service for elevators to and including fused disconnect switches at machine room door and standby power source, transfer switch and connection from auxiliary contacts in transfer switch to controller.

1.04 DEFINITION

A. Defective Elevator Work
   1. Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe operation and/or conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions. In regards to defective work, the decisions of the Engineer and Elevator Consultant are final.

1.05 SUBMITTALS

A. Product Data and Catalogue Information:
   1. Include capacity sizes, performances, operation, safety features, finishes and similar information.
   2. Catalogue cuts shall be provided for the following:
      a. Controller and Machine Drive
      b. Machine
      c. Hoist Motor

d. Sheaves
e. Governor and Tension Weight Assembly
f. Buffers
g. Guide Shoes
h. Signal fixtures, Car & Hall
i. Complete door operating system
j. Brake assembly
k. Traction Controller including recommended spare parts

B. Shop Drawings:
1. Show plans elevations, sections, and large scale details indicating service at the landing, machine room layout, coordination with building structure, relationships with other construction, and location of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support and maximum and average power demands. Custom engineered detail drawings to include the following:
a. Hoistway and Elevator Equipment Room Layouts- Plan and Elevation, including reactions and loads imposed on the building structure by the elevator equipment located on the elevator hoistway drawings. Hoistway and elevator equipment room layout drawings to be sealed by a Professional Engineer, licensed to do business in the locale of this installation.
b. Signal Operating Fixture Detail
c. Elevator Cab Details
d. Hoistway Entrance Detail
e. Car Door Operating Equipment Details
f. Electrical Requirements

C. Samples:
1. For exposed finishes of cars, hoistway door and frames, and signal equipment, 3 inch square samples of sheet materials; and 4 inch lengths of running trim members.

D. Manufacturer Certificates:
1. Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on the drawings, and electrical service, including emergency generator, as shown and specified are adequate for elevator system being provided.

E. Maintenance Manuals, Keys, Certificates:
1. Include operation manuals, maintenance manuals, adjustment manuals, troubleshooting manuals, parts manuals, emergency instructions, and similar information required to properly maintain, adjust, and repair the equipment installed. Include diagnostic and repair information available to manufacturer and Installer's maintenance personnel. Submit as part of the Project close-out and prior to final payment.
2. Ten (10) sets of keys to operate all keyed operating functions, all marked and identified. Any key requiring a special blank for copying shall be identified.

F. Inspection and Acceptance Certificates and Operating Permits:
1. As required by the authorities having jurisdiction for normal, unrestricted elevator use.

1.06 QUALITY ASSURANCE

A. Standards and Regulations
1. Materials, design, clearances, construction, workmanship, operation and tests shall be in accordance with the requirements of the most recent adopted issues of the ASME/ANSI A 17.1 Safety Code for Elevators, Dumbwaiters, and Escalators, the National Electric Safety Code, the International Code Council (ICC) Code, the NFPA Code, and all other Codes, regulations, laws, including ADA, and ordinances as may govern. Where conflicts occur in the above codes, the most rigid shall apply. It is the duty of the elevator contractor to investigate the related Codes to insure that the installed equipment complies with all Codes governing their work.

2. Equipment to be provided and installed shall be in accordance with the Seismic Zone Risk category of the project location.
3. Nothing contained in these specifications shall conflict with any Codes or federal, state or local laws, ordinances, rules or regulations governing the work.

B. Manufacturers:
1. Manufacturers shall be ones regularly engaged in the business of design, engineering and manufacturing of elevators, or elevator components, of the type and character required by these specifications and shall manufacture the entire assembly from products of their own make, or others, and assume full responsibility for the products used in said assembly. ONLY NON-PROPRIETARY EQUIPMENT WILL BE SUPPLIED AND INSTALLED.

C. Elevator Contractors:
1. Elevator Contractors shall be regularly engaged in the business of design, engineering, manufacturer, installation and servicing of elevators of the type and character required by these specifications, shall be or represent an approved manufacturer, and shall assume full responsibility for the products used in assembling the elevator equipment.
2. Elevator Contractors shall be able to demonstrate elevators that they have installed of similar design and scope and shall have been in service for at least five years prior to this bid date.
3. Elevator Contractor shall be able to show successful experience in the complete maintenance of elevators, employ competent personnel to handle the service, maintain locally an adequate supply of stock of parts for replacement or emergency and have qualified employees locally available to insure the fulfillment of the service demands of this facility without reasonable delay.
4. Elevator Contractor shall provide a reasonable estimate of the time to respond to emergency service calls for entrapments and regular service calls for repairs.

D. Material Standards:
1. Materials to be furnished under these specifications shall be new, shall be of the best grade and quality used for the purpose of commercial practice and shall be of the latest standard product as advertised in printed catalogues by reputable manufacturers.
   a. AluminumExtrusions per ASTM B-221; sheet and plate per ASTM B-209.
   b. Bronze Stretcher leveled, resquared sheets composed of 60% copper and 40% zinc similar to Muntz metal, Alloy Group 2 with #4 finish, grains of belting shall be in direction of the longest dimension.
   c. Nickel-Silver, Copper-Nickel-Zinc Extrusions of CDA alloy C77600.
   d. Steel Low carbon, cold rolled to stretcher leveled standard flatness per ASTM A-366 for sheet; per ASTM a-36 for structural.
   e. Satin Stainless Type 302 or 304 with #4 finish on exposed surfaces per ASTM A-167, grains of belting shall be in the longest dimension.
   f. Polished Stainless Type 302 or 304 with #8 polished finish.
   g. Plastic Laminate NEMA LD1, Type 1, 1/16" thick.
   h. Paint All exposed metal work, except as otherwise noted, shall be cleaned of oil, grease, scale, and other foreign matter and receive a factory coat of manufacturer's standard rust-resistant primer applied.
   i. Prime Finish All surfaces which are to receive an enamel finish shall be cleaned of oil, grease, scale, rust, etc., and have one coat of rust resistant mineral paint applied following by a filler coat over uneven surfaces, then the surface shall be sanded smooth and a final coat of mineral paint applied.
   j. Enamel Finish All surfaces shall be primed per the preceding specification for Prime Finish and then have two (2) coats of enamel in the color selected applied. All paint to be electrostatically applied.

E. Equipment Standards:
1. Equipment to be furnished under these specifications shall be new and shall be the latest standard product as advertised in printed catalogues by reputable manufacturers. Major items of the equipment shall be of the best grade and quality used for the purpose of

commercial practice and shall have the Manufacturer's name, address, and catalogue numbers on a plate securely affixed to the equipment in a conspicuous place.

2. Equipment or apparatus of any one system must be the product of one manufacturer, or equivalent products of a number of manufacturers, which are suitable for use in a unified or assembled system. All parts of the elevator equipment shall be built to standard dimensions, tolerances and clearances in order to ensure complete interchangeability of similar parts of similar machines and devices. The mechanical fastenings used throughout the equipment on parts subject to wear and replacement shall be key and seat, nut and bolt, screw or other removable type not requiring physical deformation.

F. Accessibility Requirements

1. In addition to local governing regulations, comply with Section 4.10 in the US Architectural & Transportation Barriers Compliance Board's "American with Disabilities Act (ADA), Accessibility Guidelines (ADAAG). And Section 407 of ANSI A117.1.

1.07 COORDINATION

A. Coordinate the installation of sleeves, blockouts, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to project site in time for installation.

B. Coordinate locations and dimensions of other work relating to elevators, including pit ladders, sumps, and floor drains in pits, entrance subsills, and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

C. Confirm power, floor designations, travel, clear overhead, pit depths, emergency recall floors, main and alternate, dispatch floor locations, etc., prior to fabrication of equipment.

D. Provide engineering information as necessary to coordinate the interface work of other trades impacting the elevator work.

1.08 WARRANTY

A. Vendor will provide a written warranty and guarantee of all equipment provided and installed against defects in materials and workmanship for a period of one (1) year from the Substantial Completion of the final individual elevator system or for the standard period of the manufacturer's warranty, whichever is longer. Vendor will correct any defects not due to ordinary wear and tear or improper use or care which may develop during this equipment warranty period. This warranty is not intended to supplant normal maintenance service and shall not be construed to mean that the Vendor shall provide free service or periodic examination, lubrication, or adjustment due to normal use, beyond that included in the specifications (see Maintenance Service, below). This warranty includes all labor and material to repair and/or replace any defective or failed part within the warranty period.

1.09 MAINTENANCE SERVICE

A. Provide warranty period full coverage comprehensive preventive maintenance service commencing upon taking any elevator car out of service to begin repairs and continuing through the twelve month Warranty period as indicated in the project narrative. The maintenance service to be provided shall be all inclusive and not include any prorations or exclusions. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.

B. Vendor shall perform all services indicated on the attached "Elevator Maintenance Checklist" at least once monthly per elevator car. The attach list shall have all maintenance items defined or required by the elevator manufacturer as monthly maintenance in the elevator Installation, operation, and maintenance manual, added to the attached list; to ensure manufacturer warranty compliance. Each list shall be elevator specific. Perform preventive maintenance and service work during regular working hours (7:00am to 5:00pm) of regular working days, unless specifically requested to be performed at other times by the Owner.

C. Provide emergency callback service on a 24 hour, 7 day per week basis during construction and the warranty period.

D. Respond to all service requests for service during the regular working hours within one hour. Respond to all requests for service after regular working hours within two hours, regardless of the time of day or day of the week that a service call is placed. Regular hours in Building 1 during a Legislative Session are considered to be 24/7.

E. Include all adjustments, lubrications, cleaning supplies and parts necessary to keep the equipment in proper operation, except such adjustments, parts or repairs made necessary by misuse or abuse (by parties other than the Vendor).

F. Repair or replace electrical or mechanical parts of the elevator equipment, whenever required, and use only genuine parts produced by the manufacturer of the equipment concerned.

G. Perform tests of the elevator and elevator operation as often as required by the Code of the locale in which the project is located. If the authority having jurisdiction adopts no Code, all testing shall be in conformance with all tests outlined in the most recent published ASME/ANSI A17.1.

H. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts shall be produced by manufacturer of original equipment.

I. Vendor will be required to schedule monthly maintenance visits with Owner. Vendor will be required to document monthly maintenance visits having been conducted by filing an executed copy of the "Elevator Maintenance Checklist" with the Owner's representatives (their Maintenance Supervisors for each of the buildings), by email, within 24 hours of having completed the maintenance visit. T

1.10 CONTINUING MAINTENANCE

A. Upon the expiration of the twelve month Warranty specified, the systems will be added to the Owner's standing maintenance contract. All documentation related to warranty repairs will be executed during the warranty period and turned over to the Owner on the last day of warranty.

1.11 MAINTENANCE SERVICE AND SUPPORT

A. Any special tools, software, PDA's, computer(s), used for programming, adjusting, and/or downloading changes in the original software shall be provided to the Owner prior to final payment. Controllers with removable technician diagnosis displays must have the displays in place on each controller at startup. the displays become the property of the Owner as part of the contract. The display must be the highest technician level display available for the system.

B. Notify the Owner and provide to the Owner continuing information regarding changes to be performed to the equipment to comply with manufacturer's recommended and/or authorized changes and repairs, modifications, adjustment, replacements, etc., and to perform any repairs and/or replacements of equipment components required by the component manufacturer to be made to correct faulty design or manufacturer, to permit for the continued integrity and safe operation of the equipment provided under the elevator installation contract and this specification.

C. Provide field and technical assistance and instructions to the Owner, within a reasonable time frame, following the Owner's request.

D. Upon request by the Owner, provide any/all technical information publications, bulletins, notices, etc., which outline recommendations for changes in design and/or replacement of installed equipment for a period of ten (10) years after completion and acceptance of the installation.

PART 2 PRODUCTS GEARLESS TRACTION PASSENGER SERVICE ELEVATOR SYSTEMS

2.01 PRODUCTS - MANUFACTURERS

A. Subject to compliance with the requirements of the specifications and drawings, the following manufacturers are approved manufacturers for the project.
   1. Geared Traction Elevators
      a. Thyssen Krupp Elevator Company
      b. Otis Elevator Company

c. Schindler Elevator Company
d. Imperial Electric
e. Tourin
f. Kone Inc.
g. Hollister Whitney Elevator

B. Manufacturer Substitutions: See Substitutions Sections of these specifications.

C.

2.02 ELEVATOR EQUIPMENT SUMMARY - BUILDING 5 ELEVATORS 1 ,2, 3, & 4

A.	QUANTITY:	Existing	Four (4) Passenger Elevators, (Grouped)
B.	TYPE:	Existing	Overhead traction passenger
C.	CAPACITY:	Existing	3500#
D.	SPEED:	New	500 fpm
E.	TRAVEL:	Existing	Approximately 140' +/-- Contractor to field verify
F.	STOPS:	Existing	11
G.	OPENINGS:	Existing	11 in line
H.	CONTROL:	New	Variable Voltage, Variable Frequency/AC w/Regen
I.	OPERATION:	New	Four (4) Car Programmable Duplex, with Central Dispatch
J.	POWER:	Existing	480V; 3 phase; 60 cycle (Confirm in Field)
K.	MACHINE:	New	Overhead Gearless Traction
L.	MOTOR:	New	Single Speed AC
M.	CAR FRAME:	New	Steel channel car frame
N.	SAFETY:	New	Flexible guide clamp safety
O.	GOVERNOR:	New	Centrifugal with electrical overspeed switch.
P.	PLATFORM:	New	Steel platform with wood sub floor
Q.	CAR FLOOR:	New	2' x 2' anti-slip molded rubber floor tile
R.	GUIDE RAILS:	New	Replace under the directiojn of a WV Professional Engineer
S.	COUNTERWEIGHT:	New	New frame and filler weights
T.	GUIDE SHOES:	New	Roller type
U.	HOIST CABLES:	New	Sufficient size and strength
V.	GOVERNOR CABLE:	New	As recommended by manufacturer
W.	BUFFERS:	New	Oil type for Car & Counterweight
X.	ENTRANCES:	Existing	U/L labeled 3'4" w. x 7'0" h. Verify in field. Stainless steel.
Y.	DOOR PANELS:	New	U/L labeled 3'4" w. x 7'0" h.. Verify in field. Fingerprint resistant stainless steel finish. Inspect facia, dust covers, secure and reinforce to minimize deflection, paint numerals on facia. Replace missing dust covers. All door panels to be replaced. GAL MOVFR door operator, replace door header

Z. DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain 3D scanner multiple beam proximity detector.
AA. CAB:	New	Passenger: Standard modular steel shell with reveal wood laminate panels, stainless car panels and trim. One (1) handrail on side wall, single speed fan, certificate frame, six (6) LED downlight in stainless steel island ceiling, #4 stainless return, transom, car doors, pads and buttons.
AB. SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone, Digital car position indicator with directional arrows, fireman's jack and speaker, tamperproof fasteners, natural bronze finish as selected during submittals, verbal annunciator.Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Video monitoring and communications system: "Comply with all ASME A17.1-2019 code requirement for emergency communications (emergency communications only, not the entire 2019 code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding." The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. The traveler cable will incoporate one spare conductor for each utilized conductor by type and application. Digital direction lantern at the opening or car directional lantern in the car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman's recall switch at main floor, fireman's jack at main floor. Provisions to be made for emergency generator and individual emergency generator operation at fire command center, remote monitoring, top and bottom access

AC.	OTHER:	New	Mount LED lighting the complete length of the elevator hoistway. Activation switches will be mounted at terminal floors by a single on/off key switch marked “lights”. In addition, the fire service Phase 1 key switch upon activation shall also activate these lights. The installed system will provide the full capability to have the later addition of an integrated display and monitoring system a third party software package such as LiftNet without changes to the controller hardware or software. Compliance with this requirement must be demonstrated as part of submittal approval. All hall fixtures to have stainless steel finish.

2.03 ELEVATOR EQUIPMENT SUMMARY - BUILDING 5 ELEVATOR 6

A.	QUANTITY:	Existing	One (1) Passenger Elevator
B.	TYPE:	Existing	Overhead traction passenger
C.	CAPACITY:	Existing	2500#
D.	SPEED:	Existing	500 fpm
E.	TRAVEL:	Existing	Approximately 140' +/-- Contractor to field verify
F.	STOPS:	Existing	11
G.	OPENINGS:	Existing	11 in line
H.	CONTROL:	New	Variable Voltage, variable frequency/AC w/Regen
I.	OPERATION:	New	One (1) Car Programmable Simplex
J.	POWER:	Existing	480V; 3 phase; 60 cycle (Confirm in Field)
K.	MACHINE:	New	Overhead Gearless Traction
L.	MOTOR:	New	VVVF AC Gearless
M.	CAR FRAME:	New	Steel channel car frame
N.	SAFETY:	New	Flexible guide clamp safety
O.	GOVERNOR:	New	Centrifugal with electrical overspeed switch.
P.	PLATFORM:	New	Steel platform with wood sub floor
Q.	CAR FLOOR:	New	2' x 2' anti-slip molded rubber floor tile
R.	GUIDE RAILS:	New	Replace under the direction of a WV Professional Engineer
S.	COUNTERWEIGHT:	New	New frame and filler weights
T.	GUIDE SHOES:	New	Roller type
U.	HOIST CABLES:	New	Sufficient size and strength
V.	GOVERNOR CABLE:	New	As recommended by manufacturer
W.	BUFFERS:	New	Oil type for Car & Counterweight

X.	ENTRANCES:	Existing	U/L labeled 3'4" w. x 7'0" h. Verify in field. Baked enamel except main floor.
Y.	DOOR PANELS:	New	U/L labeled 3'4" w. x 7'0" h.. Verify in field. Fingerprint resistant stainless steel finish. Inspect facia, dust covers, secure and reinforce to minimize deflection, paint numerals on facia. Replace missing dust covers. All door panels to be replaced. GAL MOVFR door operator, replace door header
Z.	DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain 3 D scanner multiple beam proximity detector.
AA.	CAB:	New	Passenger: Standard modular steel shell with reveal wood laminate panels, stainless car panels and trim. One (1) handrail on side wall, single speed fan, certificate frame, six (6) LED downlight in stainless steel island ceiling, #4 stainless return, transom, car doors, pads and buttons. Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone, Digital car position indicator with directional arrows, fireman's jack and speaker, tamperproof fasteners, #4 stainless finish, verbal annunciator. Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Video monitoring and communications system: "Comply with all ASME17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding. The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. Digital direction lantern at the opening or car directional lantern in the car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman's recall switch at main floor, fireman's jack at main floor.

		Provisions to be made for emergency generator, remote monitoring, top and bottom access
AB. SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone, Digital car position indicator with directional arrows, fireman's jack and speaker, tamperproof fasteners, natural bronze finish as selected during submittals, verbal annunciator, Video monitoring and communications system: "Comply with all ASME A17.1-2019 code requirement for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding." Digital direction lantern at the opening or car directional lantern in the car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman's recall switch at main floor, fireman's jack at main floor. Provisions to be made for emergency generator, remote monitoring, top and bottom access Dial floor indicators will be provided as indicated on the project drawings, CJ Anderson is an acceptable vendor, the dial indicators will be custom to fit the available space in the existing door header panel. The final configuration, hand and lettering type etc. will be determined during submittals.
AC. OTHER:	New	Mount LED lighting the complete length of the elevator hoistway. Activation switches will be mounted at terminal floors by a single on/off key switch marked "lights". In addition, the fire service Phase 1 key switch upon activation shall also activate these lights. The installed system will provide the full capability to have the later addition of an integrated display and monitoring system a third party software package such as LiftNet without changes to the controller hardware or software. Compliance with this requirement must be demonstrated as part of submittal approval. All hall fixtures to have natural bronze finish. A combination of satin and polished surfaces will be used as required to complete the aesthetic design.

2.04 CODE COMPLIANCE

The elevator controller shall use a microprocessor-based logic system and shall comply with all applicable elevator and electrical safety codes. The following codes are to be used as a minimum standard, follow most recent adoption if stated code varies from adopted code.

ANSI/ASME A17.1-2013

NFPA

IBC 2013

ANSI/ ASHRAE/ IES Standards 90.1-2013 (Elevator Energy Use Standard)

The elevator contractor is to be advised of the possibility of the need for hall access switches depending upon the distance measured to the car top from the top floor while the car is level with the floor below. If this distance exceeds 35", a hall access switch is to be provided.

If the distance from the rear of the cab to the rear hoistway wall exceeds 12“ a railing must be installed on the car top per the ANSI A.17.1 Code. Proper overhead clearances to be observed.

2.05 ADA REQUIREMENTS

The elevator controllers shall comply with Title III of the Americans with Disabilities Act (ADA).

Leveling Accuracy - The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of .25" (12.7 mm) or better under all loading conditions up to the rated load.

Hall Lanterns - The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down.

Car Position Indicators - The controller shall have a position indicator output to drive the required position indicator which shall indicate the corresponding floor numbers as the car passes or stops at a floor. An audible signal shall sound as the position indicator changes floors.

2.06 ENVIRONMENTAL CONSIDERATIONS

Ambient temperature: 32F degrees to 104F degrees (0C degrees to 40C degrees).

Humidity: non-condensing up to 95%

2.07 DIAGNOSTICS

The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator statuses as an integral part of the controller.

2.08 INTENDED OPERATION OF CRITICAL COMPONENTS

Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

2.09 STATUS INDICATORS

Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is closed, when the door locks are closed, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection/Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. In addition, a means shall be provided to display other special or error conditions that are detected by the microprocessor.

2.10 CONTROL AND MAINTENANCE

A. The control system shall be closed loop feedback variable voltage type control system, which shall govern the starting, stopping and direction of travel of the elevator. The control shall use a solid state motor drive power converter for the elevator, which shall apply variable voltage to the elevator motor. The closed loop feedback speed control regulator system shall vary the voltage applied to the elevator hoist motor, during acceleration and retardation periods, without interrupting the power to the hoist motor. On stopping, the hoist motor shall be slowed down to leveling speed by regenerative or dynamic braking. Complete electric controlled stopping shall be made before the brake is set on the brake drum. The leveling system shall correct for overtravel or undertravel within 1/4", measured between car and landing door sill, where it is caused by changes in load on the platform after the car has made the initial stop. The initial stop shall be made without any releveling.

B. The motor drive and its components shall be designed and rated specifically for elevator duty. The solid state control system shall incorporate factory determined and preset functions to precisely determine the speed of the elevator at any instant of travel in accordance with a predetermined acceleration and rate of acceleration factor. The functions shall be preset at the factory.

C. A system shall be provided as part of the control to limit harmonic distortion to 5% to limit the generation of surge currents and to eliminate the need for special auxiliary drive protection. The AC line shall be protected from transients and regenerated power notching shall be reduced to the main power source. Filters shall be designed for the reduction of the 360 Hz acoustic noise level.

D. The elevator hoist motor current shall be electronically controlled by a separate phase controlled supply. The brake current shall be controlled by a current feedback loop to provide constant brake coil current. Resistant changes due to brake coil heating shall be compensated for without any additional external resistors and heat losses. Brake pickup current and brake holding current shall be independently adjustable.

E. The elevator hoist motor current shall be electronically controlled. The current shall be monitored and shall be maintained at the adjusted level through a feedback load.

F. The control system shall be designed to automatically bring the car to a floor landing. The stop shall be smooth without any sudden brake application. The floor approach shall be without hesitation or delay in time. Floor sensing devices shall correct overtravel and undertravel and shall maintain the car within a maximum of 1/4" of the floor line, regardless of rated capacity, load or direction of travel.

G. A positive means of determining the position of the elevator in the hoistway at all times shall be provided as a part of the elevator control system. Floor location for leveling shall be determined via magnetic strips affixed to a tape, or vanes, to define the floor-leveling zone.

H. The individual car controller shall be capable of learning the position of the floor in the building. The car controller software program shall create an optimum velocity profile of car travel from any floor to any other floor and provide smooth and stepless elevator operation. All system motion parameters, i.e., jerk, acceleration, deceleration rates, etc., shall be field programmable and be stored as non-volatile memory.

I. The control system shall include a microprocessor for processing, adjusting and diagnostics. The system shall provide comprehensive means to access the computer memory for elevator

adjusting and diagnostic purposes and shall have permanent indicators to show elevator status as an integral part of the controller.

J. The failure of any switch, contact, or relay to release in the intended manner, the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended, or the occurrence of a single accidental ground or short circuit shall not permit the car to operate.

K. Status indicators shall be provided on the controller to indicate when the safety circuit is open, when the door locks are open, when the elevator is running at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator is out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. A means shall also be provided for the displaying of other special or error conditions that are detected by the microprocessor.

L. Door protection timers shall be provided for both open and close directions, which protect the door motor. The door operator protection timer shall cease attempting to open the doors after a predetermined time in the event that the doors are prevented from opening the open position. The door close protection timer shall reopen the doors for a short time if the door closing attempt fails to make up the door locks after a predetermined time.

M. A test switch shall be provided on the controller which shall allow independent operation of the elevator without door open functioning for purposes of adjustment or testing of the elevator. The elevator shall not respond to hall calls and shall not interfere with the other cars in the system.

N. The control equipment shall have all control parameters stored permanently on erasable programmable read-only memory.

O. The microprocessor shall be equipped with on-board diagnostics for troubleshooting and field programmability. The field changes shall be stored permanently using non-volatile memory.

P. The controllers shall be enclosed in properly ventilated metal cabinets with sides and top, and with hinged access doors on the front and back. The controllers shall be mounted on isolation pads to prevent noise from being transmitted through the building structure. Rubber mats shall be installed on the floor in front and behind the controller, as required, for electrical grounding protection of the equipment. Airborne noise shall be suppressed so as to be inaudible outside of the enclosed machine room.

Q. All controller printed circuit boards, discrete components, switches, and other items of control equipment shall be mounted on panels which shall be made of a moisture-resisting, noncombustible material which shall be securely mounted in a substantial, self supporting steel frame with fastenings suitable for panel demounting. A vibration absorbing mounting shall be provided for the steel frame, if necessary, to eliminate perceptible vibration.

R. Electro-mechanical switches and relays shall be used where heavy current is supplied and/or safety circuits required by the Elevator Codes.

S. Switches shall be direct current type, magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating and excessive wear, and provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc deflectors or suppressers.

T. All switches printed circuit boards and discrete components shall be mounted in the front of panels together with any small electronic components. Large capacity resistors shall be mounted on the rear or top of panels.

U. Time delay circuits shall be electronic.

V. Wiring on the controller, whether factory or field wiring, shall be done in neat workmanlike manner and all connections shall be made to studs and/or terminate by means of grommets, solderless lugs or similar connections. All wiring shall be copper.

W. Terminal blocks with identifying studs shall be provided on the controller for connection of board wiring and external wiring.

X. Identifying symbols or letters shall be permanently marked on or adjacent to the device on the controller and the marking shall be identical to marking used on the wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders.

Y. All input-output devices shall be marked similarly to relays for easy reference to wiring diagrams.

Z. The main dispatch floor, the Fireman's Recall floor and the Alternate Fireman Recall floor shall be determined prior to fabrication of the control equipment. The control shall be programmable to enable the dispatch and recall floors to be changed in the field.

AA. The elevator control shall be connected to a computer peripheral, such as Lift-Net, or equal, that will monitor each elevator in real time, regardless of location, and be able to provide detailed information about current operation, system events, faults, and operating status.

AB. The drives shall be completely isolated from the building electrical system so that there will be no interference with other electrical systems in the property as a result of spikes and feedback resulting from the motor design, application or installation.

AC. The controller will be provided with an uninterruptible power supply (UPS) which willl power the controller for 60 minutes, permit controlled travel by gravity to the hearest floor, and open the car doors to permit egress on the loss of building power. The UPS may be outboard of the controller.

2.11 DUPLEX COLLECTIVE OPERATION (GROUPED CARS) - CENTRAL DISPATCH

A. Group Automatic Operation Control: Applies to cars in two or more elevator shafts, with microprocessor and multicar operation.
   1. Provide with central dispatch controller above individual car controllers.
   2. Refer to description provided in ASME A17.1.
   3. Include group automatic operation controls responsive to variations of traffic demand.
   4. Provide system in car so that momentary pressure on one or more of car buttons causes car to start moving in direction of registered call.
   5. Allow only one car to stop in response to any one landing call.
   6. If a car stops for a landing call, and car button matching direction the car was traveling is pressed within a predetermined time interval after a landing stop, proceed in same direction regardless of other landing calls that are registered.
   7. Automatically separate car from group service if it is delayed for predetermined time period, and automatically restore car to group service when delay is corrected.
   8. Hold car for a predetermined time interval at landings when stops are made to enable passengers to enter or leave the car.
   9. Program system to minimize delays caused by registration of car calls disproportionate to number of persons in car.
   10. If a car is removed from service, the other cars shall answer car and landing calls.
   11. When car, without registered car calls, arrives at floor landing where both up and down calls are registered, initially respond to landing call in direction of travel.
      a. If no car or landing call is registered for future travel in that direction, respond to landing call in opposite direction.
   12. Operate landing lanterns to correspond with next direction of travel, and when responding to landing call, operate landing lantern to match direction of call being answered.
   13. Program door operating sequence to minimize car and landing door open and close time periods.
   14. Independent Service Operation: The car operating station shall be equipped with a key-operated switch labeled "IND SER" located in the locked access compartment. When activated existing hall call registration shall extinguish and hall buttons shall remain inoperative as an indication to passengers that there is no elevator service. Include independent service control as follows:
      a. Provide a switch in the car control cabinet to allow removal of a designated car from group service; car to operate in response to car calls only.
      b. Doors open automatically upon arrival at landing.

c. Set landing indicator panels as inoperative when in independent service mode.

15. Door Dwell Time: Door dwell times shall be field adjustable with resolution to 0.1 seconds. The dwell time at the main dispatch floor shall be adjustable between 3 and 30 seconds. The dwell time for a car call stop at a typical floor shall be adjustable between 1 and 10 seconds. The hall call timing shall predominate in the event of a coincidental car and hall call stop. Upon interruption of the car door proximity detector, the door open time shall be reduced to an adjustable time of 0.5 to 5 seconds. The proximity detector control door dwell time shall be separately adjustable for car and hall calls. Dispatch floor dwell time shall be canceled when the system is on Down peak operation.
16. Anti-Nuisance: In the event car loading or operation is not commensurate with the number of calls registered, all car calls shall be canceled.
17. Load Weighing By-Pass: The elevators shall bypass hall calls and bypass lobby door dwell time and dispatch from the main lobby when their respective load weighing devices are activated. The load weighing devices shall weigh the live load in the cab and provide a signal to the elevator control system when the live load has reached a predetermined level. Initially, the load weighing devices shall be set at 50% for lobby dispatch and 60% for hall call bypass.
18. Nudging: In the event the doors are held open, or prevented from closing, for a predetermined adjustable period of time, initially to be set at 20 seconds, after automatic door closing has been initiated, a buzzer shall continuously sound and the doors shall not reopen. The doors shall not be permitted to close, even at a reduced speed, if an obstruction is in the plain of the proximity detector curtain. When the obstruction is removed the doors are permitted to close, the doors shall close at a reduced speed. The buzzer shall continuously sound until the doors are fully closed. The door open button shall remain operable at all times during this sequence.
19. Inspections Service Operation: Provide key operated switch in the main car operating panel that, when turned to the “on” position, shall cause the elevator to be removed from service and placed in Inspection Service Operation.
20. Hoistway Access Operation: Provisions to be made at terminal landings to allow access to the hoistway through the use of key operated access switches. These keys shall be in accordance with Security Group Classification as required by applicable code.
21. Emergency Power: Provisions to be made to controller to run on emergency power source when activated.
22. Elevator Security Interface Requirements: Provisions to be made for card reader type access. Control shall be on an individual floor programmable basis allowing the user to access only those floors for which their access is programmed. Contractor to coordinate with Owner's security as to control and required circuitry.

2.12 SIMPLEX SELECTIVE COLLECTIVE OPERATION, SINGLE CARS ONLY

A. Simplex, selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call pushbuttons shall cause the car to start and run automatically, provided the hoistway door interlocks and car doors contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which car or hall calls set for the direction of travel are received, regardless of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls.

B. Door Dwell Time: Door dwell times shall be field adjustable with resolution to 0.1 seconds. The dwell time at the main dispatch floor shall be adjustable between 3 and 30 seconds. The dwell time for a car call stop at a typical floor shall be adjustable between 1 and 10 seconds. The hall call timing shall predominate in the event of a coincidental car and hall call stop. Upon interruption of the car door proximity detector, the door open time shall be reduced to an adjustable time of 0.5 to 5 seconds. The proximity detector control door dwell time shall be separately adjustable for car and hall calls. Dispatch floor dwell time shall be canceled when the system is on Down peak operation.

C. Anti-Nuisance: In the event car loading or operation is not commensurate with the number of calls registered, all car calls shall be canceled.

D. Load Weighing By-Pass: The elevators shall bypass hall calls and bypass lobby door dwell time and dispatch from the main lobby when their respective load weighing devices are activated. The load weighing devices shall weigh the live load in the cab and provide a signal to the elevator control system when the live load has reached a predetermined level. Initially, the load weighing devices shall be set at 50% for lobby dispatch and 60% for hall call bypass.

E. Nudging: In the event the doors are held open, or prevented from closing, for a predetermined adjustable period of time, initially to be set at 20 seconds, after automatic door closing has been initiated, a buzzer shall continuously sound and the doors shall not reopen. The doors shall not be permitted to close, even at a reduced speed, if an obstruction is in the plain of the proximity detector curtain. When the obstruction is removed the doors are permitted to close, the doors shall close at a reduced speed. The buzzer shall continuously sound until the doors are fully closed. The door open button shall remain operable at all times during this sequence.

F. Independent Service Operation: The car operating station shall be equipped with a key-operated switch labeled “IND SER” located in the locked access compartment. When activated existing hall call registration shall extinguish and hall buttons shall remain inoperative as an indication to passengers that there is no elevator service.

G. Inspections Service Operation: Provide key operated switch in the main car operating panel that, when turned to the “on” position, shall cause the elevator to be removed from service and placed in Inspection Service Operation.

H. Hoistway Access Operation: Provisions to be made at terminal landings to allow access to the hoistway through the use of key operated access switches. These keys shall be in accordance with Security Group Classification as required by applicable code.

I. Emergency Power: Provisions to be made to controller to run on emergency power source when activated.

J. Elevator Security Interface Requirements: Provisions to be made for card reader type access. Control shall be on an individual floor programmable basis allowing the user to access only those floors for which their access is programmed. Contractor to coordinate with Owner's security as to control and required circuitry.

2.13 SIMPLEX HOME LANDING OPERATION

A. If no calls are registered, this operation shall cause the car to travel to a predetermined home landing floor and stop without door operation. If the car is en route to the home landing and a call appears from the opposite direction, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed nonstop in response to any normal call.

2.14 CONTROLLER DIAGNOSTICS

A. The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using non-volatile memory. The microprocessor board shall provide the features listed below.
   1. On-board diagnostic switches and an alphanumeric display shall provide user-friendly interaction between the mechanic and the controller.
   2. On-board real time clock shall display the time and date and is adjustable by means of on-board switches.
   3. Field programmability of specific timer values (i.e., door times, MG shutdown time, etc.) may be viewed and/or alternated through use of the on-board switches and pushbuttons.

2.15 FIREMAN/EMERGENCY OPERATION

A. Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to applicable local codes.

B. The elevator control system shall be tied in with the Fire Alarm system and tested with the Fire Alarm system contractor.

C. C. Activation of the Phase 1 switch shall automatically activate the hoistway riser of LED light fixtures mounted in the elevator hoistway at each landing.

2.16 INDEPENDENT SERVICE

A. Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call-push-button or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

2.17 TERMINAL ELEVATOR STOPPING DEVICES

A. Terminal stopping Devices shall be provided at the top and bottom of the hoistway and shall be operated by a fixed cam securely attached to the elevator. The switches shall be located to operate should the elevator travel a predetermined distance above or below the upper or lower terminal landing.

B. The switches shall be independent of any other stopping device, shall positively open without the use of springs to cut off all power to the device and shall prevent the operation of the elevator in either direction.

2.18 ELEVATOR LANDING SYSTEM

A. The landing system shall provide high speed stepping signals, one-floor-run stepping signals, leveling and door zone signals and optional floor encoding signals. The output signal shall be electrically isolated and shall be capable of reliably operating at 120 VAC.

B. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors and magnetic strips for stepping, leveling and optional floor encoding.

C. Normal and Final Terminal stopping devices shall be installed to stop the car automatically from any speed obtained under normal operation within the top and bottom overtravel, independent of the operating devices, final terminal stopping device and the buffers.

D. Emergency terminal slowdown switches shall be used when the car rated speed dictates.

2.19 TOP OF CAR INSPECTION STATION, PIT SWITCH

A. An inspection and maintenance control station shall be mounted on top of the elevator car. This station shall contain Up and Down direction buttons and an emergency stop switch, 110v GFI duplex receptacles, work light with shield, and an audible and visual signal to comply with Fireman/Emergency control requirements. When the car is on inspection mode, it shall operate at a reduced speed by constant pressure on the appropriate direction of travel button. Provision shall be made to make normal operating devices inoperative while the car top operating device is in use. A toggle switch in the control operating panel shall operate a switch on the elevator equipment room controller to place the station in and out of service.

B. A stop switch shall be provided in the elevator pit and be located adjacent to the pit access door or access ladder in accordance with ANSI A17.1 requirements.

2.20 PIT LIGHT AND GFI RECEPTACLE

A. A pit light switch shall be provided for the car located at the proper height within the hoistway in accordance with ANSI A17.1 requirements. The pit light device will have a guard to protect the light bulb from damage.

B. A GFI duplex receptacle shall be installed in the elevator pit.

C. A metal pit ladder shall be installed in the elevator pit and shall extend 48" above the finish floor of the lowest landing. Location and installation of this device will be in accordance with ANSI A17.1 requirements.

2.21 AMERICAN WITH DISABILITIES ACT

A. The elevator system operation and equipment shall be designed and installed to comply with the requirements of the American with Disabilities Act.

2.22 SIGNALS AND OPERATING FIXTURES

A. The elevator shall have a car operating panel, located in the return panel of the car enclosure. The car operating panel shall contain a series of car operating buttons with integral knowledge light illumination corresponding to the landings served, a keyed emergency stop switch, an alarm bell button with jewel, a Door Open button, a Door close button. The car operating panel shall include a fireman emergency operation key switch, jewel and call cancel button. Pressure upon a car call button shall cause the button to illuminate. When the car stops in response to this car call, the call shall be canceled and the button illumination extinguished. Plates containing raised numerals and braille indications shall be mounted flush adjacent to the floor button and also the door open and door close buttons, and the alarm bell in the car operating panel.

B. Control and service switches, integral with car operating panel, shall include a keyed independent service switch, inspection key switch, keyed light switch, keyed fan switch, emergency light test switch, two (2) additional spare switch modules left blank for future use, and other control operating devices required to meet the requirements of the specification and/or Code. Adjustable volume electronic toners shall provide audible signaling of floor passing and car stop, and adjustable volume buzzers shall signal door delay and fireman emergency.

C. A hands-free telephone, and wiring from the telephone to terminals on the elevator controller, shall be provided in the car-operating panel. Others shall provide telephone wiring to the machine room controller location. The hands-free telephone shall be integral with the car operating panel and include instructions for use, a pushbutton to initiate the call, a microphone transmitter, a speaker and an acknowledge light to indicate when the call has been answered. The operation of the telephone shall automatically signal call acknowledgment and automatically reset on calls termination and not require any special action on the part of the operator. The telephone shall have the capability for ring-down use with an in-house telephone system or operate with a standard dial tone.

D. An LED digital readout position indicator shall be provided in the car operating panel, to indicate the position of the car in the hoistway, and include arrows to indicate the direction of travel of the car. The readouts shall be approximately 1.5" high.

E. A directional lantern with adjustable electronic toners shall be provided at the entrance at the floor. Directional lanterns shall signal once if a car is traveling in the Up direction and twice if in the Down direction and signal waiting passengers of the arrival of the next elevator and direction of travel.

F. An LED position indicator with direction of travel arrows shall be mounted integral with the hall lantern at the floor identified in the Equipment Summary. The numerals and the arrow shall be illuminated with sufficient intensity to permit easy reading of the indicator. The readouts shall be approximately 2" high.

G. Landing pushbutton fixtures containing Up and/or Down pushbuttons shall be provided at the floor. Illumination shall be provided in the button which shall light upon pressure registration of a call at that landing and be extinguished when a car responds to that call. Provide quality as listed in the Elevator Summary/Equipment Schedule. Pushbutton fixtures to be mounted at the recommended height for ADA requirements. Prior cutouts and/or boxes for existing hall stations can be utilized for extender type hall stations to meet this requirement. If extender type hall station fixtures are not utilized, the existing hall station cutout shall be filled and the wall surface finished to match the existing wall covering. No cover plates will be allowed. Include fireproofing of all wall penetrations.SEE DRAWINGS FOR SIGNAL LOCATIONS AND ADDITIONAL REQUIREMENTS. Verify final location with Engineer prior to installation.

H. A Fireman/Emergency Operation key switch shall be located at the primary Fireman access floor elevator lobby and in the Fire Command Center to permit elevators to be recalled manually via operation of that key switch. The operation of the system and the location of the key switch will be determined by local Code requirements. The primary Fireman access floor and alternative floor shall be confirmed prior to fabricating the control or installing the key switch station.

I. All fixture faceplates shall be a minimum of 1/8" thick with a natural #4 brushed finish. All edges to be beveled on all sides of the faceplate. All finish grains to run in the longest direction of the plate.

J. The car station shall contain an emergency light fixture and power supply to operate it and the alarm bell in the event of loss of normal power.

K. A verbal annunciator shall be provided.

2.23 GEARLESS HOIST MACHINE AND HOIST MOTOR

A. The elevator hoisting machine shall be the manufacturer's standard geared traction type with a hoist motor, brake, and direct drive sheave aligned and mounted on a structural steel bed plate. The machine bed plate shall rest on rubber isolation pads to effectively isolate the machine from the building structure. The drive sheave shaft shall rotate in tapered roller bearings. The sheave shall be an integral casting. The sheave shall be cast iron of proper hardness to give minimum wear of sheave and hoist cables. A thrust bearing shall be removable without dismantling the machine. A gasket inspection handhold shall be provided in the bearing housing to permit inspection of the bearing. Suitable drain plugs, overflow pipes and oil level indicator shall be provided. Adequate means of lubrication shall be provided. Oil seals and gaskets shall be provided to prevent leakage of lubricating oil. No less than four (4) hoist cables of adequate size shall be utilized. Hoist cable sheave contact with the drive sheave shall not be less than 150 degrees and not more than 230 degrees. Hoist rope stray between gearless machines and the deflector sheaves shall be limited to one-eighth (1/8) inch per one (1) foot of free rope between the sheaves for all ropes on the sheave. Sheave guards shall be provided to guard hoist cables between the drive sheave and the deflector sheave.

B. The mechanical brake shall be spring applied and electronically released, designed to stop the elevator at all loads without shock or jar and be sufficient to hold the elevator at any landing with the normal amount of counterbalancing and with 125% of contract load in the elevator.

C. The elevator gearless machine selected should utilize the most energy efficient technology that is practical for the building and its passenger use. The drive selected shall provide for regenerated power. The motor shall have sufficient capacity to operate continuously at 100% of contract speed and 100% of contract load. A factory mounted encoder will be installed at the end of the motor shaft. Provide a separate dynamic braking module to control overhauling motor speed, reduce hoist motor deceleration time and dissipate regenerative power complete with a separate resistor bank to absorb power regenerated by the hoist motor and a 3-phase Ac contactor rated for the proper HP with overload protection to disconnect the inverter from the hoist motor whenever the elevator is stopped.

D. The AC hoist motor shall be coupled directly to the sheave. The motor shall have sufficient capacity to operate continuously at 100% of contract speed and 100% of contract load. The frame and brackets of the motor shall be made of rugged cast iron. The rotor will be of die cast aluminum, and laminations of fully processed electrical steel. The end thrust will receive greaseable ball bearings. The enclosure is of drip proof construction with Class B insulation and a 50 degree C rating. The hoist motor will be of the low slip design (2-5%), 60 minute duty with 180 starts per hour rating. A factory mounted encoder will be installed at the end of the motor shaft. Provide a separate dynamic braking module to control overhauling motor speed, reduce hoist motor deceleration time and dissipate regenerative power complete with a separate resistor bank to absorb power regenerated by the hoist motor and a 3-phase AC contactor rated for the proper HP with overload protection to disconnect the inverter from the hoist motor whenever the elevator is stopped.

E. Ascending Car Overspeed Protection Device shall be provided to prevent an ascending elevator from striking the hoistway overhead structure. The device shall decelerate the car with any load up to the rated capacity by applying an emergency brake. Its operation shall be in conformance to ASME A17.1 Safety Code.

F. Unintended Car Movement Protection Device shall be provided to prevent unintended car movement away from the landing when the car and hoistway doors are not closed and locked.

G. A mechanical device, independent of the normal braking device shall be provided that will stop the elevator should it overspeed or move in an unintended manner.

H. Machine beams will be installed to support the elevator hoisting machine and deflector sheave from the building structure.

I. Cable chutes shall be provided under all elevator equipment room floor slab cutouts, where required by Code.

J. Machine cable guards shall be provided

K. Machine room flooring will be leveled and smooth. Any steel embedded in the machine room floors from prior installation, or this modernization, shall be removed and all voids will be filled with liquid cement.

2.24 MACHINE LOCATION

A. A. The machine shall be located at the top of the hoistway, directly over the hoistway and be mounted on structural steel beams or channels furnished by the Elevator Contractor, together with any necessary bearing plates and hitch beams. The Elevator Contractor shall survey the existing machine room location and the existing machine beams to insure that the new machine and its imposing loads upon the machine room slab and hoistway structure is compatible. The elevator contractor will have his layouts reviewed and certified by a PE certified by the state of West Virginia, that the new machine and associated equipment and impact loads, will be supported by the existing flooring and existing machine beams and new machine blocking.

2.25 DEFLECTOR SHEAVES

A. Ball Bearing or roller bearing sheaves, of the minimum diameter as determined by Code, shall be provided under the machine of the overhead machine application.

B. The Elevator Contractor shall provide all steel channels, beams and bearing plates as necessary for sheave support.

2.26 CAR FRAME AND SAFETY

A. A new structural car frame and sling assembly shall be provided. The car frame shall be properly reinforced, as required, so as to relive the car enclosure from any undue strain.

B. A new and approved safety mechanism will be furnished and installed on the car safety plank members. A centrifugal governor located over the hoistway shall activate the safety. The safety shall stop the elevator whenever excessive descending speed is experienced and means shall be provided to cut off power from the motor and apply the brake prior to application of the safety. The safety shall be provided with a switch to cut off power from the motor and apply the brake if the safety applies without tripping of the governor.

C. A new governor system shall be provided which shall include a centrifugal governor and a weighted tension sheave. The governor shall be arranged so that the carrier shall not release due to system dynamics when the elevator is subject to an emergency stop in the up direction. The governor shall include a bi-directional switch to disconnect power to the elevator prior to setting of the governor jaws. The pull through of the governor shall be set to work in accordance with the pull through requirements of the safety.

D. The underside of the car platform shall incorporate either a fireproof stop of all exposed wood surfaces and/or laminated surfaces. The means of fireproofing shall be accomplished with sheet steel of at least 0.0164 inches thick or with equally fire retardant material; or painting with an approved fire retardant paint having a flame spread rating of not over 50.

E. The entrance side of the platform shall be equipped with a smooth metal guard of not less than 0.0598 inches thick and shall extend the full width of the widest hoistway door opening. It shall have a smooth vertical face, extending below the floor the distance of the leveling zone, plus three (3) inches, but in no case less than twenty-one (21) inches. The lower portion of the guard shall be bent back not less than 60 degrees nor more than 75 degrees from the horizontal.

F. A strain gauge load-weighing device to work in conjunction with new control system shall be provided to signal for lobby dispatch to bypass main floor door dwell time and loaded car hall call bypass. Initially, the load weighing device shall be set at 50% for hall call bypass and 60% for lobby door dwell time bypass dispatch and adjust to suit the building's subsequent needs.

2.27 COUNTERWEIGHT AND FRAME

A. The existing structural steel counterweight frame and subweight shall be replaced and new filler weights shall be provided. The counterweights shall be balanced, with additional steel or lead weights if necessary, for proper counterbalance with the car.

B. A new counterweight guard in the pit shall be provided.

2.28 GUIDE RAILS

A. The existing guide rails shall be replaced or retained at the discretion of the contractor, determined prior to bidding. The rails and rail bracket fastenings shall be examined and resecured to the building structure as necessary. The machined running surface of the guide rails shall be thoroughly cleaned and belt sanded to remove rust and provide a smooth running surface. All joints shall be filed smooth and the equipment shall be checked and adjusted to within 1/8" (+/-) top to bottom and face to face, as required for proper and smooth operation of the elevator.

B. Whether retained or replaced, the unmachined portion of the guide rails and brackets shall be cleaned, then painted with rust inhibitor paint at the conclusion of the project.

2.29 HOIST CABLES

A. Hoist cables of sufficient size and strength in order to maintain an adequate factor of safety shall be installed and comply with the requirements of the Code. Cable tags shall be provided and installed per Code.

B. Wedge clamp shackles shall be provided for all dead ends of the hoist cables. Proper installation techniques shall be utilized.

C. The governor cable shall be of the design and size as recommended by the manufacturer.

2.30 ROLLER GUIDES

A. Roller guide assemblies shall be provided on all cars and counterweights. The roller guide assemblies shall consist of three (3) roller wheels of a durable resilient material rotating on a sealed ball bearing and mounted on a substantial base to permit continuous contact with the machined running surfaces of the guide rails. Roller guides will be provided with adjustable stops.

2.31 OIL BUFFER

A. New oil buffers shall be supplied in the pit for car and counterweight assemblies. Assemblies shall be installed at the proper height to allow for suitable compression and to maintain sufficient clearances for run-by as required by Code.

B. Data plates shall be affixed as required by Code.

C. Buffers and buffer mounting channels, stands and platforms shall be painted with rust inhibiting paint.

2.32 ENTRANCE ASSEMBLIES

A. The existing hoistway landing entrance assemblies shall be retained. All fastenings of the retained apparatus shall be made secure. Any repairs that may be required or alternations necessary to adapt the new doors and door operating equipment to the existing hoistway

landing entrance assemblies shall be performed. Each door frame shall be cleaned, sanded, filled where necessary and receive a coat of primer and paint, as selected by GSD and applied electrostatically. The lobby floor entrance frame and doors shall be refinished in place.

B. Landing sills for all openings shall be reused. All sills shall be cleaned and polished to an “as new” condition. Sill angles shall be cleaned, painted in accordance with other requirements in the project manual, and resecured where necessary. The sill surface shall be installed flush with the existing entrance floor surface. All cracked, chipped concrete at the entrance shall be repaired. A bead of waterproof caulk shall be applied where the sill surface meets the concrete floor.

C. New baked enamel steel hollow metal UL labeled doors shall be provided at the entrance. Door panels shall be properly reinforced and shall be provided with two (2) removable laminated phenolic sill guides, which will run in the sill slots. The door shall receive a baked enamel steel sight guard. Fire stops shall be provided on the panel. Floor numbers will be painted six (6) inches high on the inside of the respective floor door panel.

D. Headers and struts to support the new door track assemblies shall be provided.

E. The existing facia, hanger covers, and dust covers may be retained, if in compliance with Code and if reinforced resecured, degreased, and painted with rust inhibitor paint, otherwise new facia to be provided.

F. Floor identification jamb plates shall be provided on the side of the entrance frame at 60 inches above the finished floor line. The plate shall be a minimum of four (4) inches square, black background with stainless steel characters.

G. New stainless steell “In Case of Fire...” signs shall be installed at the floor and incorporated into the cover of the hall call stations.

H. All jamb plates shall conform to the latest ANSI A117.1 standard and shall include main floor and Medical use symbols

2.33 DOOR OPERATOR

A. A motor driven heavy-duty door operator with closed loop control system and all electronic and digital operation shall be provided. The door operator shall be mounted on the car top and shall open and close at the car door and hatch door simultaneously at any landing through the use of roller release assemblies and clutch assemblies.

B. The closed loop control shall give constant feedback on position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based upon the position and load of the door. The operator will be adjusted by using a hand-held keypad programmer where adjustment will be stored in the keypad and downloaded to another operator.

C. The operator shall contain test switches for open, close, nudging and speed zone set-up.

D. The control box housing of the electronic components for the operator will be made of material and seals to be water-resistant.

2.34 PROXIMITY EDGE

A. A stationary 3D proximity detector shall be installed on the car door between the leading edge of the car door and the landing door. The detector shall include a full curtain array of LED lightrays to fully cover the entire opening and be so arranged that, should an obstruction cross the plane of the array of beams, the car doors shall automatically reverse to the open position. Upon reopening, the doors shall remain open for a predetermined amount of time or stay open until the obstruction is cleared. If the obstruction remains in the path of the car door for an adjustable period of time, an adjustable volume buzzer shall continuously sound until the doors are released and allowed to fully close at a reduced rate of speed less than 2 ½ foot pounds.

2.35 ELEVATOR CAB ENCLOSURE

A. A new cab enclosure shall be provided. The cab will be of steel construction with raised wood panels on all walls. The return, car door, and transom will be constructed of #4 stainless steel. The cab will have pad button of stainless steel, a two speed fan, a certificate frame, two (2) sets

of pads per building, handrails on three (3) sides with returned edges, VAT flooring, vents, emergency exit with switch. The contractor shall submit samples or pictures of the cab to be installed.

B. All elevator cab appliances shall conform to electrical efficiency requirements of Standard 90.1 (Section 10.4.3)
   1. Lighting: For elevator ceiling downlights, the sum of the lumens (lm) divided by the sum of the watts shall be no less than 35/lm/W.
   2. Ventilation: Cab ventilation fan for the elevator shall not consume over 0.33 W/cfm at the maximum speed.
   3. Standby Mode: When cab is stopped and unoccupied with doors closed for 15 minutes, cab interior lighting and ventilation shall be de-energized until required for operation.

2.36 ELECTRIC WIRING

A. New wiring and conduit and wiring troughs to be installed on this installation. All wiring shall conform to the latest edition of the NEC Code for elevator installation.

B. The traveling cable shall include a minimum of three (3) pairs of twisted shielded wires for use by a building security and/or communication system, one (1) coax cable, two CAT 6 cable, and any other special wiring as may be required to accommodate telephone, security, and fire requirements. All travelling cables shall be rated for elevator duty.

C. A minimum of fifty (50) percent spares shall be provided for all traveling cables and hoistway cables.

D. An emergency alarm bell shall be installed on the car top, and outside the hoistway at the lowest landing.

E. All interlock wiring shall be Teflon insulated, or as required by Code.

F. New main line disconnects shall be installed as part of this contract by a licensed electrician with a master's West Virginia license. These disconnects shall be located on the lock side of the machine room door and within sight of all equipment.

G. New 110 v. single-phase lighting disconnects shall be installed next to the new main line disconnects. The disconnect shall be lockable.

2.37 PAINTING

A. The elevator equipment room floor and pit floor shall be painted with two coats of deck enamel, after final adjusting. Refuge space on car top and in pit shall be painted a contrasting color.

B. All exposed ferrous metal surfaces of machines, motors, controllers, and any other equipment installed or retained, shall receive a coat of rust inhibiting paint. After installation, the equipment shall receive a final coat of paint.

C. The existing door frames of both elevators, with the exception of the main floor, shall be sanded and filled and receive a coat of primer and paint applied electrostatically and not painted by hand.

D. The lobby door panels will be removed and refinished and receive a coat of protective lacquer and rehung with new door gibs and fire stops.

2.38 PERFORMANCE

A. The elevators shall be required to meet the following performance criteria and/or as stated in the NEII-1 Standard Performance for elevators.
   1. CONTROL
      a. Acceleration and deceleration parameters to be recorded, laminated, and kept in the elevator machine room with a target of 1.6 ft/s²; also bound in the O&M Manuals.
   2. OPERATING TIME
      a. Brake to Brake: 6-7 seconds
      b. Flight Time: 9.5-11.0 seconds
      c. Speeds not to vary under any load condition more than 5%
   3. DOOR TIME

a. Opening 1.5 seconds to 3/4 opening
b. Closing 3.5 to fully closed position
c. Door Dwell 5.0 seconds car call
5.0 seconds for hall call

4. BRAKE
   a. Hold a minimum 125% of rated load.

2.39 TESTS

A. Arrange the safety so that the car stops on a safety test, with both no load and full load, without damage to the equipment, and within ANSI A17.1 requirements.

B. Calibrate, test and seal governor and document according to Code requirements.

C. All tests shall conform to ANSI A17.1 §8.10.2 and 8.10.3 with appropriate documentation as to tags and records outlined in this code.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine elevator areas for compliance with requirements for installation tolerances and other conditions affecting performance and/or compliance with these specifications. Examine hoistway, hoistway openings, pits, and machine rooms as constructed: verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected as part of the contract.

3.02 PROJECT MANAGEMENT AND SUPERVISION

A. Designate an experienced Project Manager to perform the administrative management of this project and place a competent Superintendent in charge of the project throughout the course of the work. Assign an on-site job Foreman to be responsible for day to day operations and scheduling with the Owner. Make available the Project Manager and Superintendent to assist in the progress and coordination of the work of the project in all matters relating to the project.

3.03 MATERIALS

A. Coordinate with the Owner for suitable storage of all materials, road boxes, and tools. Contractor to maintain insurance for all tools and equipment and shall be responsible for the safe keeping of them at all times.

B. Protect equipment and exposed finishes during transportation, erection, and construction against damage.

3.04 HOISTING, HANDLING, AND INSTALLATION OF EQUIPMENT

A. Install all equipment according to manufacturer's recommendations.

B. Install all equipment with proper clearances complying with referenced and applicable codes and specifications.

C. Install all items so that they are safely accessible for maintenance and so that they may be removable via portable hoist or other means for maintenance and repair.

D. Contractor shall be responsible for all hoisting of all equipment involved in this installation.

3.05 DEMONSTRATION AND INSTRUCTIONS TO OWNER

A. Demonstrate operation of elevators to Owner's personnel, and designees, and provide instructions in the proper use, operation and daily maintenance of the elevators.

B. Review emergency procedures for entrapments with the Owner's representative, and designees. Train Owner's representative, and designees, in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner and designees on requirements and checklists to complete an elevator maintenance program.

3.06 SPECIAL TOOLS, INSTRUCTIONS, AND TOOL MAINTENANCE

A. That which lies herein this section is a bonded project requirement and must be acknowledged by the Surety on the project bonds by section reference.

B. Upon completion of the project, provide one (1) set of any diagnostic tools and computers, including all manuals, codes, passwords, accessories and sundries necessary to operate the diagnostic tools and computers, in order to test, adjust, maintain and troubleshoot the elevator equipment provided and for diagnostic evaluations and system monitoring. Instructions shall be provided for the operation of the diagnostic tools and computers and for all functions relating to testing, adjusting and maintenance. Diagnostic tools and computers provided to the Owner shall be capable of performing all levels of diagnostic; systems adjustments and software program changes which are available to the Elevator Contractor. Any diagnostic system shall provide user-friendly interaction between the serviceman and the controls, as approved by the Architect/ Engineer. The Documentation shall include a description of component function, a hard copy of all as-built schematics, a hard copy set of source codes utilized in developing any control software, and an electronic copy of all source codes utilized. Any and all such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the manufacturer.

C. Provide to the Owner periodic update, maintenance, recalibration and/or reinitiating of diagnostic tools, computers and accessories, upon release by manufacturer, or upon request from the Owner, for a period of ten (10) years from the date of final acceptance of the elevator, regardless of whether the Elevator Contractor is the maintenance contractor for the elevator. Provide the Owner with a loaner diagnostic tool or computer at no cost to the Owner, should the Owner's tool or computer be required to be replaced, recalibrate or reinitiated, until the Owner's original tool or computer is returned.

D. Provide to Owner three (3) bound sets of printed instructions for use of any tool or computer that may be necessary to perform diagnostic evaluations, system adjustment, maintenance troubleshooting and/or programmable software changes on any unit of the control equipment, including access codes, passwords and other information necessary to interface with microprocessor control equipment. In addition, provide step by step adjusting, programming and troubleshooting procedures and a composite listing of the individual settings chosen for the variable software parameters stored on the software programs of motion and dispatch controller and motor drives.The name of the manufacturer and the manufacturer's catalog number shall be provided for all components not manufactured by the elevator installer.

E. Controllers with removable technician diagnosis displays must have the displays in place on each controller at startup. the displays become the property of the Owner as part of the contract. The display must be the highest technician level display available for the system.

F. The Owner must receive all required drawings, manuals and parts lists before final payment is made to the Contractor or substantial completion is granted. The fact that a drawing, manual or maintenance tool may contain proprietary information is not considered by the Owner to be sufficient reason for refusing to furnish any drawing or manual.

G. Provide field and technical assistance and instructions to the Owner, or designess, upon notification, and within a reasonable time (3 working days) following the Owner's request.

H. E. Provide to the Owner all field engineering bulletins, technical information publications, software upgrades or changes, issued by any manufacturer used on this installation for a period of ten (10) years after acceptance.

I. The contractor's surety must acknowledge these requirements, in writing, prior to the release of bonds and final payment.

3.07 REFERENCE MAINTENANCE CHECKLIST

A. Elevator Maintenance Checklist

1. Inside The Car
   Sweep clean door guides & channels ensure smooth operation of door movement.
   Inspect car interior for ceiling, wall and handrail damage or lose mountings.

Inspect all light functions and replace bulbs.
Test Emergency Stop button for functionality.
Confirm emergency phone is functioning and audible speakers are working clearly.

2. Outside the Car
   Replace any lights that are not functioning.
   Inspect the door panels and clearances as well as Hoist way doors.
   Check floor of car to remain flush with landing not exceeding ½" variance.
3. Machine Room
   Check lubrication schedules and levels and top off as necessary.
   Check for frayed cables running full length of car travel to all floors.
   Electrical inspection tighten all connections, observe loose connections.
   Visually inspect for any wiring discoloration or evidence of overheating.
   Hydraulics fluid level and potential leaks visual inspection.
4. Pit Inspection
   Inspect Car Buffer for oil leakage or spring over compression for car and counterweights.
   Clean out and sweep floor.
   Inspect sump and pump operation for unrestricted flow.
5. Top of Car
   Ensure the emergency hatch is functional and easily accessible.
   Test the brakes and inspect shoes, no signs of shavings or metal dust.
   Inspect the pit for proper clearances.
   Inspect the car frame for any signs of damage or cracks in welded joints.
6. Any other requirements by the manufacturer related to monthly maintenance, required in the manufacturer's I,O,M Manual will be added to the above.

7. Notes: _____

   _____

   _____

8. TECHNICIAN:_____

9. Owner acceptance:_____

END OF SECTION

SECTION 14 2401

HYDRAULIC ELEVATOR MODERNIZATION (FULL)

PART 1 GENERAL

1.01 GENERAL REFERENCE

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

1.02 DESCRIPTION OF WORK

A. This specification relates to the full modernization of existing hydraulic elevators in Building 15, Building 17, Building 84 & Building 86 . Requirements beyond this section, found elsewhere in the project documents, apply to the work in this section.

B. Perform all required field engineering surveys and provide all engineering, labor, materials, tools, equipment, transportation, and supervision in order to design, engineer, fabricate and install the elevator plant as shown on the Drawings and listed in this Specification documents, complete in a first class workmanship manner. All work shall be done in accordance with the requirements of all local codes and applicable regulations, which may govern the requirements of this installation.

C. The work to be performed shall include the furnishing and installation of all labor, materials and equipment as hereinafter specified. The Contractor shall provide all work to furnish a complete installation. The apparent silence of the Specifications as to any detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only the best material and workmanship is to be used; and interpretation of these Specifications shall be made upon that basis. The Engineer and the elevator consultant are the final authority on determining compliance to all requirements herein.

1.03 SUMMARY

A. This Section includes electric traction passenger elevators.
   1. Related work includes the following:
      a. “Fire Alarm” for smoke detectors in elevator lobbies to initiate emergency recall operation and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation and for connection to elevator controllers.
      b. “Premise Telephone Wiring” for telephone service to elevators.
      c. Mechanical and Plumbing Requirements.
      d. Electrical service for elevators to and including fused disconnect switches at machine room door and standby power source, transfer switch and connection from auxiliary contacts in transfer switch to controller.
      e. General Construction as shown on the drawings

1.04 DEFINITION

A. Defective Elevator Work
   1. Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe operation and/or conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.05 SUBMITTALS

A. Product Data and Catalogue Information:
   1. Include capacity sizes, performances, operation, safety features, finishes and similar information.
   2. Catalogue cuts shall be provided for the following:
      a. Controller and Machine Drive
      b. Hydraulic pumping units
      c. Pump motors

d. Hydraulic Valves
e. Cab Interiors
f. Buffers
g. Guide Shoes
h. Signal fixtures, Car & Hall
i. Complete door operating system for passenger and freight
j. Hydraulic jack and PVC protection
k. Recommended spare parts for passenger and freight

B. Shop Drawings:
1. Show plans elevations, sections, and large scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and location of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support and maximum and average power demands. Custom engineered detail drawings to include the following:
a. Hoistway and Elevator Equipment Room Layouts- Plan and Elevation, including reactions and loads imposed on the building structure by the elevator equipment located on the elevator hoistway drawings. Hoistway and elevator equipment room layout drawings to be sealed by a Professional Engineer, licensed to do business in the State of West Virginia.
b. Signal Operating Fixture Detail
c. Elevator Cab Details
d. Hoistway Entrance Detail
e. Car Door Operating Equipment Details (Passenger & Freight)
f. Electrical Requirements
g. Hydraulic jack units with PVC sealed system
h. Heat load in elevator machine room

C. Samples:
1. For exposed finishes of cars, hoistway door and frames, and signal equipment, 3 inch square samples of sheet materials; and 4 inch lengths of running trim members.

D. Manufacturer Certificates:
1. Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on the drawings, and electrical service, including emergency generator, as shown and specified are adequate for elevator system being provided.

E. Maintenance Manuals, Keys, Certificates:
1. Include operation manuals, maintenance manuals, adjustment manuals, troubleshooting manuals, parts manuals, emergency instructions, and similar information required to properly maintain, adjust, and repair the equipment installed. Include diagnostic and repair information available to manufacturer and Installer's maintenance personnel. Submit as part of the Project close-out and prior to final payment.
2. Ten (10) sets of keys to operate all keyed operating functions, all marked and identified. Any key requiring a special blank for copying shall be identified.

F. Inspection and Acceptance Certificates and Operating Permits:
1. As required by the authorities having jurisdiction for normal, unrestricted elevator use.

1.06 QUALITY ASSURANCE

A. Standards and Regulations
1. Materials, design, clearances, construction, workmanship, operation and tests shall be in accordance with the requirements of the most recent adopted issues of the ASME/ANSI A 17.1 Safety Code for Elevators, Dumbwaiters, and Escalators, the National Electric Safety Code, the IBC/BOCA Code, the NFPA Code, and all other Codes, regulations, laws, including ADA, and ordinances as may govern. Where conflicts occur in the above codes, the most rigid shall apply. It is the duty of the elevator contractor to investigate the related Codes to insure that the installed equipment complies with all Codes governing their work.

Failure of the specification to state a specific requirement of the local authority having jurisdiction's requirements does not relieve the contractor from compliance of the various codes.

2. Equipment to be provided and installed shall be in accordance with the Seismic Zone Risk category of the project location.
3. Nothing contained in these specifications shall conflict with any Codes or federal, state or local laws, ordinances, rules or regulations governing the work.

B. Manufacturers:
   1. Manufacturers shall be ones regularly engaged in the business of design, engineering and manufacturing of elevators, or elevator components, of the type and character required by these specifications and shall manufacture the entire assembly from products of their own make, or others, and assume full responsibility for the products used in said assembly. ONLY NON-PROPRIETARY EQUIPMENT WILL BE SUPPLIED AND INSTALLED.

C. Elevator Contractors:
   1. Elevator Contractors shall be regularly engaged in the business of design, engineering, manufacturer, installation and servicing of elevators of the type and character required by these specifications, shall be or represent an approved manufacturer, and shall assume full responsibility for the products used in assembling the elevator equipment.
   2. Elevator Contractors shall be able to demonstrate elevators that they have installed of similar design and scope and shall have been in service for at least five years prior to this bid date.
   3. Elevator Contractor shall be able to show successful experience in the complete maintenance of elevators, employ competent personnel to handle the service, maintain locally an adequate supply of stock of parts for replacement or emergency and have qualified employees locally available to insure the fulfillment of the service demands of this facility without reasonable delay.
   4. Elevator Contractor shall provide a reasonable estimate of the time to respond to emergency service calls for entrapments and regular service calls for repairs.

D. Material Standards:
   1. Materials to be furnished under these specifications shall be new, shall be of the best grade and quality used for the purpose of commercial practice and shall be of the latest standard product as advertised in printed catalogues by reputable manufacturers.
      a. Aluminum Extrusions per ASTM B-221; sheet and plate per ASTM B-209.
      b. Bronze - Stretcher leveled, re-squared sheets composed of 60% copper and 40% zinc similar to Muntz metal, Alloy Group 2 with #4 finish, grains of belting shall be in direction of the longest dimension.
      c. Nickel-Silver, Cooper-Nickel-Zinc Extrusions of CDA alloy C77600.
      d. Steel - Low carbon, cold rolled to stretcher leveled standard flatness per ASTM A-366 for sheet; per ASTM a-36 for structural.
      e. Satin Stainless - Type 302 or 304 with #4 finish on exposed surfaces per ASTM A-167, grains of belting shall be in the longest dimension.
      f. Polished Stainless - Type 302 or 304 with #8 polished finish.
      g. Plastic Laminate - NEMA LD1, Type 1, 1/16" thick.
      h. Paint - All exposed metal work, except as otherwise noted, shall be cleaned of oil, grease, scale, and other foreign matter and receive a factory coat of manufacturer's standard rust-resistant primer applied. Paint shall be electrostatically applied.
      i. Prime Finish - All surfaces which are to receive an enamel finish shall be cleaned of oil, grease, scale, rust, etc., and have one coat of rust resistant mineral paint applied following by a filler coat over uneven surfaces, then the surface shall be sanded smooth and a final coat of mineral paint applied.
      j. Enamel Finish - All surfaces shall be primed per the preceding specification for Prime Finish and then have two (2) coats of enamel in the color selected applied.

E. Equipment Standards:

1. Equipment to be furnished under these specifications shall be new and shall be the latest standard product as advertised in printed catalogues by reputable manufacturers. Major items of the equipment shall be of the best grade and quality used for the purpose of commercial practice and shall have the Manufacturer's name, address, and catalogue numbers on a plate securely affixed to the equipment in a conspicuous place.
2. Equipment or apparatus of any one system must be the product of one manufacturer, or equivalent products of a number of manufacturers, which are suitable for use in a unified or assembled system. All parts of the elevator equipment shall be built to standard dimensions, tolerances and clearances in order to ensure complete interchangeability of similar parts of similar machines and devices. The mechanical fastenings used throughout the equipment on parts subject to wear and replacement shall be key and seat, nut and bolt, screw or other removable type not requiring physical deformation.

F. Accessibility Requirements
1. In addition to local governing regulations, comply with Section 4.10 in the US Architectural & Transportation Barriers Compliance Board's "American with Disabilities Act (ADA), Accessibility Guidelines (ADAAG). And Section 407 of ANSI A117.1.

1.07 COORDINATION

A. Coordinate the installation of sleeves, blockouts, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to project site in time for installation.

B. Coordinate locations and dimensions of other work relating to elevators, including pit ladders, sumps, and floor drains in pits, entrance subsills, and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

C. Confirm power, floor designations, travel, clear overhead, pit depths, emergency recall floors, main and alternate, dispatch floor locations, etc., prior to fabrication of equipment. It is the responsibility of the elevator contractor to verify all measurements, loads, location, shown on the architectural layouts. Any deviation from the architectural drawings and/or specifications shall be identified by the elevator contactor as non-conforming and brought to the attention of the General Contractor, Architect, and elevator consultant for suggested remediation.

D. Provide engineering information as necessary to coordinate the interface work of other trades impacting the elevator work.

1.08 WARRANTY

A. Vendor will provide a written warranty and guarantee of all equipment provided and installed against defects in materials and workmanship for a period of one (1) year from the Substantial Completion of the final individual elevator system or for the standard period of the manufacturer's warranty, whichever is longer. Vendor will correct any defects not due to ordinary wear and tear or improper use or care which may develop during this equipment warranty period. This warranty is not intended to supplant normal maintenance service and shall not be construed to mean that the Vendor shall provide free service or periodic examination, lubrication, or adjustment due to normal use, beyond that included in the specifications (see Maintenance Service, below). This warranty includes all labor and material to repair and/or replace any defective or failed part within the warranty period.

1.09 MAINTENANCE SERVICE

A. Provide warranty period full coverage comprehensive preventive maintenance service commencing upon taking any elevator car out of service to begin repairs and continuing through the twelve month Warranty period as indicated in the project narrative. The maintenance service to be provided shall be all inclusive and not include any prorations or exclusions. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.

B. Vendor shall perform all services indicated on the attached "Elevator Maintenance Checklist" at least once monthly per elevator car. The attach list shall have all maintenance items defined or

required by the elevator manufacturer as monthly maintenance in the elevator Installation, operation, and maintenance manual, added to the attached list; to ensure manufacturer warranty compliance. Each list shall be elevator specific. Perform preventive maintenance and service work during regular working hours (7:00am to 5:00pm) of regular working days, unless specifically requested to be performed at other times by the Owner.

C. Provide emergency callback service on a 24 hour, 7 day per week basis during contruction and the warranty period.

D. Respond to all service requests for service during the regular working hours within one hour. Respond to all requests for service after regular working hours within two hours, regardless of the time of day or day of the week that a service call is placed. Regular hours in Building 1 during a Legislative Session are considered to be 24/7.

E. Include all adjustments, lubrications, cleaning supplies and parts necessary to keep the equipment in proper operation, except such adjustments, parts or repairs made necessary by misuse or abuse.

F. Repair or replace electrical or mechanical parts of the elevator equipment, whenever required, and use only genuine parts produced by the manufacturer of the equipment concerned.

G. Perform tests of the elevator and elevator operation as often as required by the Code of the locale in which the project is located. If the authority having jurisdiction adopts no Code, all testing shall be in conformance with all tests outlined in the most recent published ASME/ANSI A17.1.

H. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts shall be produced by manufacturer of original equipment.

1.10 CONTINUING MAINTENANCE PROPOSAL

A. Upon the expiration of the twelve month Warranty specified, the systems will be added to the Owner's standing maintenance contract. All documentation related to warranty repairs executed during the warranty period and will be turned over to the Owner on the last day of warranty.

1.11 MAINTENANCE SERVICE AND SUPPORT

A. Notify the Owner and provide to the Owner continuing information regarding changes to be performed to the equipment to comply with manufacturer’s recommended and/or authorized changes and repairs, modifications, adjustment, replacements, etc., and to perform any repairs and/or replacements of equipment components required by the component manufacturer to be made to correct faulty design or manufacturer, to permit for the continued integrity and safe operation of the equipment provided under the elevator installation contract and this specification.

B. Provide field and technical assistance and instructions to the Owner, within a reasonable time frame, following the Owner’s request.

C. Provide any/all technical information publications, bulletins, notices, etc., which outline recommendations for changes in design and/or replacement of installed equipment for a period of ten (10) years after completion and acceptance of the installation.

PART 2 PRODUCTS - HYDRAULIC PASSENGER & FREIGHT ELEVATORS

2.01 MANUFACTURERS

A. Subject to compliance with the requirements of the specifications and drawings, the following manufacturers are approved manufacturers for the project.
   1. Hydraulic Elevators
      a. Thyssen Krupp Elevator Company
      b. Otis Elevator Company
      c. Schindler Elevator Company
      d. Kone Inc.
      e. Canton Elevator
      f. Minnesota Elevator Company
      g. Schumacker Elevator Company

h. G.A.L.
i. PEELLE

B. Manufacturer Substitutions: See Substitutions Sections of these specifications.

2.02 ELEVATOR EQUIPMENT SUMMARY - BUILDING 15 ELEVATOR 1 (PASSENGER)

A.	QUANTITY:	Existing	One (1)
B.	TYPE:	Existing	Hydraulic Passenger (1)
C.	CAPACITY:	Existing	2500#
D.	SPEED:	Existing	Passenger 100 fpm
E.	TRAVEL:	Existing	Approximately 19' 6" Contractor to verify in field
F.	STOPS:	Existing	2
G.	OPENINGS:	Existing	2 in line
H.	CONTROL:	New	Automatic w/ solid state starters
I.	OPERATION:	New	Simplex Selective Collective
J.	POWER:	Existing	208V; 3 phase; 60 cycle, contractor to verify in field
K.	PUMPING UNIT	New	Direct submersible
L.	MOTOR:	New	Single Speed AC
M.	CYLINDER	New	New double bulkhead steel with inground PVC sleeve
N.	CAR FRAME:	New	Steel channel car frame
O.	PLATFORM:	New	Steel platform with wood sub floor
P.	GUIDE RAILS:	New	Replace under the direction of a West Virginia PE.
Q.	CAR FLOORING :	New	Rubber non-slip tile
R.	GUIDE SHOES:	New	Roller type
S.	BUFFERS:	New	Spring
T.	ENTRANCES:	Existing	U/L labeled 3' 0"w. x 7'0" h. Verify in field. If steel, to be refinished, dents filled, and painted in a color selected by GSD. Where stainless, clean and polish.
U.	DOOR PANELS:	New	Passenger: U/L labeled 3'0" w. x 7'0" h.. Verify in field. Stainless steel #4 finish. New fascia, dust. GAL MOVFR door operator, replace door header
V.	DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain scanner multiple beam proximity detector.
W.	CAB:	New	Standard modular steel shell with plastic laminate panels. One (1) handrail on rear wall, single speed fan, certificate frame, six(6) LED downlight island ceiling, #4 stainless

			return, transom, and car door, pads and buttons. Stainless toe rail at 8" AFF to match handrail profile.
X.	SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone, Video monitoring and communications system: “Comply with all ASME17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding. The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. ”Digital car position indicator with directional arrows, fireman’s jack and speaker, tamperproof fasteners, #4 stainless finish. All equipment rated for 24v, using LED lamps where provided. Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman’s recall switch at main floor, fireman’s jack at main floor. Provisions to be made for emergency generator, remote monitoring, top and bottom access The traveler cable will incoporate one spare conductor for each utilized conductor by type and application.
Y.	OTHER:	NEW	New door headers and struts will be installed on the passenger elevator. All hall fixtures on both elevators to be flush mounted.

2.03 ELEVATOR EQUIPMENT SUMMARY - BUILDING 84 ELEVATOR 1 (PASSENGER)

A.	QUANTITY:	Existing	One (1)

B.	TYPE:	Existing	Hydraulic Passenger (1)
C.	CAPACITY:	Existing	2500#
D.	SPEED:	Existing	Passenger 125 fpm
E.	TRAVEL:	Existing	Approximately 30' 6" Contractor to verify in field
F.	STOPS:	Existing	3
G.	OPENINGS:	Existing	3 in line
H.	CONTROL:	New	Automatic w/ solid state starters
I.	OPERATION:	New	Simplex Selective Collective
J.	POWER:	Existing	480V; 3 phase; 60 cycle, contractor to verify in field
K.	PUMPING UNIT	New	Direct submersible
L.	MOTOR:	New	Single Speed AC
M.	CYLINDER	New	New double bulkhead steel with inground PVC sleeve
N.	CAR FRAME:	New	Steel channel car frame
O.	PLATFORM:	New	Steel platform with wood sub floor
P.	GUIDE RAILS:	New	Replace under the direction of a West Virginia PE.
Q.	CAR FLOORING :	New	Rubber non-slip tile
R.	GUIDE SHOES:	New	Roller type
S.	BUFFERS:	New	Spring
T.	ENTRANCES:	Existing	U/L labeled 3' 0"w. x 7'0" h. Verify in field. If steel, to be refinished, dents filled, and painted in a color selected by GSD. Where stainless, clean and polish.
U.	DOOR PANELS:	New	Passenger: U/L labeled 3'0" w. x 7'0" h.. Verify in field. Stainless steel #4 finish. New fascia, dust. GAL MOVFR door operator, replace door header
V.	DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain scanner multiple beam proximity detector.
W.	CAB:	New	Standard modular steel shell with plastic laminate panels. One (1) handrail on rear wall, single speed fan, certificate frame, six(6) LED downlight island ceiling, #4 stainless return, transom, and car door, pads and buttons. Stainless toe rail at 8" AFF to match handrail profile.
X.	SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone,

			Video monitoring and communications system: “Comply with all ASME17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding. The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. ”Digital car position indicator with directional arrows, fireman’s jack and speaker, tamperproof fasteners, #4 stainless finish. All equipment rated for 24v, using LED lamps where provided. Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman’s recall switch at main floor, fireman’s jack at main floor. Provisions to be made for emergency generator, remote monitoring, top and bottom access The traveler cable will incoporate one spare conductor for each utilized conductor by type and application.
Y.	OTHER:	NEW	New door headers and struts will be installed on the passenger elevator. All hall fixtures on both elevators to be flush mounted.

2.04 ELEVATOR EQUIPMENT SUMMARY - BUILDING 86 ELEVATORS 1 & 2 (PASSENGER)

A.	QUANTITY:	Existing	Two (2)
B.	TYPE:	Existing	Hydraulic Passenger (2)
C.	CAPACITY:	Existing	3000#
D.	SPEED:	Existing	Passenger 125 fpm
E.	TRAVEL:	Existing	Approximately 30' 6" Contractor to verify in field

F.	STOPS:	Existing	5
G.	OPENINGS:	Existing	5 in line
H.	CONTROL:	New	Automatic w/ solid state starters
I.	OPERATION:	New	Simplex Selective Collective
J.	POWER:	Existing	480V; 3 phase; 60 cycle, contractor to verify in field
K.	PUMPING UNIT	New	Direct submersible
L.	MOTOR:	New	Single Speed AC
M.	CYLINDER	New	New double bulkhead steel with inground PVC sleeve
N.	CAR FRAME:	New	Steel channel car frame
O.	PLATFORM:	New	Steel platform with wood sub floor
P.	GUIDE RAILS:	New	Replace under the direction of a West Virginia PE.
Q.	CAR FLOORING :	New	Rubber non-slip tile
R.	GUIDE SHOES:	New	Roller type
S.	BUFFERS:	New	Spring
T.	ENTRANCES:	Existing	U/L labeled 3' 0"w. x 7'0" h. Verify in field. If steel, to be refinished, dents filled, and painted in a color selected by GSD. Where stainless, clean and polish.
U.	DOOR PANELS:	New	Passenger: U/L labeled 3'0" w. x 7'0" h.. Verify in field. Stainless steel #4 finish. New fascia, dust. GAL MOVFR door operator, replace door header
V.	DOOR OPERATION:	New	Closed loop solid state with car top adjustment. Car door to be equipped with full curtain scanner multiple beam proximity detector.
W.	CAB:	New	Standard modular steel shell with plastic laminate panels. One (1) handrail on rear wall, single speed fan, certificate frame, six(6) LED downlight island ceiling, #4 stainless return, transom, and car door, pads and buttons. Stainless toe rail at 8" AFF to match handrail profile.
X.	SIGNALS:	New	ADA Compliant Main car operating panel complete with register buttons, Braille, NEII symbols, Auto-dialer hands free telephone, Video monitoring and communications system: “Comply with all ASME17.1-2019 code requirements for emergency communications (emergency communications only, not the entire code). This requires a more complex cab

			communications system than in previous code versions. Review requirements in A17.1-2019 in detail prior to bidding. The installed system must have third party monitoring software available to the Owner's independent elevator monitoring call center at no charge. Proprietary systems linking hardware or software to a companion monitoring agency will not be accepted. Rath Smartview is the basis of design for this system performance requirement system. Review and acceptance is by the Engineer. ”Digital car position indicator with directional arrows, fireman’s jack and speaker, tamperproof fasteners, #4 stainless finish. All equipment rated for 24v, using LED lamps where provided. Travler cable provisions for security access and CCTV, above spares. Digital direction lantern at each opening or car directional lantern in each car, visible from the hall call station. Digital hall position indicator with arrows at main floor. Fireman’s recall switch at main floor, fireman’s jack at main floor. Provisions to be made for emergency generator, remote monitoring, top and bottom access The traveler cable will incoporate one spare conductor for each utilized conductor by type and application.
Y.	OTHER:	NEW	New door headers and struts will be installed on the passenger elevator. All hall fixtures on both elevators to be flush mounted.

2.05 CODE COMPLIANCE

A. The elevator controller shall use a microprocessor based logic system and shall comply with all applicable elevator and electrical safety codes. The following codes are to be used as a minimum standard.

B. ANSI/ASME A17.1-2013

C. NFPA

D. IBC 2013

E. ANSI/ ASHRAE/ IES Standards 90.1-2013 (Elevator Energy Use Standard)

F. The elevator contractor is to be advised of the possibility of the need for hall access switches depending upon the distance measured to the car top from the top floor while the car is level with the floor below. If this distance exceeds 35", a hall access switch is to be provided.

G. If the distance from the rear of the cab to the rear hoistway wall exceeds 12 “ a railing must be installed on the car top per the ANSI A.17.1 Code. Proper overhead clearances to be observed.

2.06 ADA REQUIREMENTS

A. The elevator controllers shall comply with Title III of the Americans with Disabilities Act (ADA).

B. Leveling Accuracy - The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of .25" (12.7 mm) or better under all loading conditions up to the rated load.

C. Hall Lanterns - The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down.

D. Car Position Indicators - The controller shall have a position indicator output to drive the required position indicator which shall indicate the corresponding floor numbers as the car passes or stops at a floor. An audible signal shall sound as the position indicator changes floors.

2.07 ENVIRONMENTAL CONSIDERATIONS

A. Ambient temperature: 32F degrees to 104F degrees (0C degrees to 40C degrees).

B. Humidity: non-condensing up to 95%

2.08 DIAGNOSTICS

A. The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator statuses as an integral part of the controller.

2.09 INTENDED OPERATION OF CRITICAL COMPONENTS

A. Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

2.10 STATUS INDICATORS

A. Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is closed, when the door locks are closed, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection/Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. In addition, a means shall be provided to display other special or error conditions that are detected by the microprocessor.

2.11 OUT OF SERVICE TIMER

A. An out of service timer (T. 0. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while there are calls existing in the system.

2.12 DOOR OPERATION

A. Door protection timers shall be provided for both the opening and closing directions, which will protect the door motor and will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened and the car removed from service.

B. A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.

C. If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during the nudging operation.

2.13 CAR AND HALL CALL REGISTRATION

A. Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire, and light the call acknowledgment lamp with a separate wire are not acceptable.

2.14 FIRE SERVICE OPERATION

A. Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to applicable local codes.

B. Activation of the Phase 1 recall shall automatically turn on a riser of lighting within the elevator hoistway. Lighting supplied shall have illumination of at least 1 foot-candle measure from the top of the elevator cab anywhere within the hoistway.

2.15 INDEPENDENT SERVICE

A. Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call push-button or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

2.16 SIMPLEX SELECTIVE COLLECTIVE OPERATION

A. Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call pushbuttons shall cause the car to start and run automatically, provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which car or hall calls set for the direction of travel are reached, regardless of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls.

2.17 SIMPLEX HOME LANDING OPERATION

A. If no calls are registered, this operation shall cause the car to travel to a predetermined home landing floor and stop without door operation. If the car is en route to the home landing and a call appears from the opposite direction, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed nonstop in response to any normal call.

2.18 LEVELING

A. The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

2.19 ELEVATOR LANDING SYSTEM

A. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors and magnetic strips for stepping, leveling and optional floor encoding.

2.20 TEST SWITCH

A. A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjustment or

testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

2.21 RELAY PANEL INSPECTION

A. A relay panel inspection switch and an up/down switch shall be provided in the controller to place the elevator on inspection operation and allow the user to move the car in the hoistway. The car top inspection switch shall render the relay panel inspection switch inoperative.

2.22 UNCANCELED CALL BYPASS

A. A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the defective call and continue to provide service in the building.

2.23 ANTI-NUISANCE (PHOTO-EYE)

A. The controller computer shall cancel all remaining car calls, if an adjustable number of car calls are answered without the computer detecting a photo eye input.

2.24 ON-BOARD DIAGNOSTICS

A. The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using non-volatile memory. The microprocessor board shall provide the features listed below.

B. On-board diagnostic switches and an alphanumeric display shall provide user-friendly interaction between the mechanic and the controller.

C. On-board real time clock shall display the time and date and is adjustable by means of on-board switches.

D. Field programmability of specific timer values (i.e., door times, MG shutdown time, etc.) may be viewed and/or altered through use of the on-board switches and pushbuttons.

2.25 OPTIONAL PERIPHERALS

A. As an integral part of the controller, the capability shall be provided to attach on-site or remote computer peripherals, yielding additional adjustment or diagnostic capabilities.

B. The elevator shall not require the functioning or presence of the microprocessor to operate on car top inspection or hoistway access operation to provide a reliable means of moving the car if the microprocessor fails.

C. A motor limit timer function shall be provided which, in case of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing and park, open the doors automatically and then close them. Car calls shall be canceled and the car taken out of service automatically. Operation may be restored by cycling the main line disconnect switch or putting the car on access or inspection operation. Door reopening devices shall remain operative.

D. A valve limit timer shall be provided which shall automatically cut off current to the down valve solenoids if they have been energized longer than a predetermined time. The car calls shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the main line disconnect switch or putting the car on access or inspection operation. Door reopening devices shall remain operative.

E. A selector switch shall be provided on the controller to select high or low speed during access or inspection operation as long as contract speed does not exceed 150 feet per minute.

F. Viscosity control shall cause the car to accomplish the following operation. If a temperature sensor determines the oil is too cold, and if there are no calls registered, the car shall go to the bottom landing and, as long as the doors are closed, the pump motor shall run without the valve coils energized to circulate and heat the oil to the desired temperature. In the event that the temperature sensor fails, a timer shall prevent continuous running of the pump motor.

G. In the event of a power failure a battery lowering device pre-wired, pre-tested and integrated into the standard enclosure shall be provided. Provisions shall also be made for emergency generator.

H. A solid state starter shall be provided and it will be mounted within the controller enclosure.

2.26 PROGRAMMABLE LOGIC

A. All available programming options or parameters shall be field programmable, without need for any external device or knowledge of any programming languages. Programmable options and parameters shall be stored in nonvolatile memory. As a minimum, there shall be a 32-character alphanumeric display used for programming and diagnostics. Programmable parameters and options shall include, but are not limited to, the following:

B. Number of Stops/Openings Served (Each Car)

C. Simplex/Duplex

D. Single Automatic Pushbutton

E. Selective Collective/Single Button Collective

F. Programmable Fire Code Options/Fire Floors (Main, Alternates)

G. Floor Encoding (Absolute PI)

H. Digital PIs/Single Wire PI's

I. Programmable Door Times

J. Programmable Motor Limit Timer

K. Nudging

L. External Car Shutdown Input (e.g., battery lowering device)

M. External Low Oil Sensor Input

N. External Viscosity Control Input

O. Parking Floors

P. Hall or Car Gong Selection

Q. Retiring Cam Option for Freight Doors

R. Independent Rear Doors

S. Standard Security

T. Emergency Hospital Service

U. Attendant Service

V. Anti-nuisance - Light Load Weighing and Photo Eye

W. Hall Access switches

X. The dispatching algorithm for assigning hall calls shall be real time, based on estimated time of arrival (ETA). In calculating the estimated time of arrival for each elevator, the dispatcher shall consider, but not be limited to, the location of the elevator, the direction of travel, the existing hall call and car call demands, the door time, flight time, lobby removal time penalty and coincidence calls.

Y. The controller shall have field programmable outputs to activate different functions based on customer needs. These functions can be outputs as listed below.

Z. Fire Phase I Return Complete Signal

AA. Fire Phase II Output Signal

AB. Hall Call Reject Signal

AC. Emergency Power Return Complete

AD. The controller shall have field programmable inputs to initiate special operations based on customer needs. These functions can be inputs as listed below.

AE. Fire Phase I Bypass Input

AF. Fire Phase II Call Cancel Input

AG. Fire Phase II Hold Input

AH. Attendant Service Input

AI. Building Security Input

AJ. Hospital Emergency Operation Input

AK. Hoistway Access

AL. The controller shall include absolute floor encoding, which upon power up, shall move the car to the closest floor to identify the position of the elevator.

AM. The controller shall have a serial port for communication with a data or computer terminal such as a CRT terminal, modem or CMS remote monitoring.

2.27 TOP OF CAR INSPECTION STATION, PIT SWITCH

A. An inspection and maintenance control station shall be mounted on top of the elevator car. This station shall contain Up and Down direction buttons and an emergency stop switch, 110v GFI duplex receptacles, work light with shield, and an audible and visual signal to comply with Fireman/Emergency control requirements. When the car is on inspection mode, it shall operate at a reduced speed by constant pressure on the appropriate direction of travel button. Provision shall be made to make normal operating devices inoperative while the car top operating device is in use. A toggle switch in the control operating panel shall operate a switch on the elevator equipment room controller to place the station in and out of service.

B. A stop switch shall be provided in each elevator pit and be located adjacent to the pit access door or access ladder in accordance with ANSI A17.1 requirements.

2.28 PIT LIGHT AND GFI RECEPTACLE

A. A pit light switch shall be provided for each car located at the proper height within the hoistway in accordance with ANSI A17.1 requirements. The pit light device will have a guard to protect the LED light bulb from damage.

B. A GFI duplex receptacle shall be installed in each elevator pit.

C. A metal pit ladder shall be installed in each elevator pit and shall extend 48" above the finish floor of the lowest landing. Location and installation of this device will be in accordance with ANSI A17.1-2013 requirements.

2.29 SIGNALS AND OPERATING FIXTURES

A. Each elevator shall have a car operating panel, located in the return panel of the car enclosure. The car operating panel shall contain a series of car operating buttons with integral knowledge light illumination corresponding to the landings served, a keyed emergency stop switch, an alarm bell button with jewel, a Door Open button, a Door close button. The car operating panel shall include a fireman emergency operation key switch, jewel and call cancel button. Pressure upon a car call button shall cause the button to illuminate. When the car stops in response to this car call, the call shall be canceled and the button illumination extinguished. Plates containing raised numerals and braille indications shall be mounted flush adjacent to each floor button and also the door open and door close buttons, and the alarm bell in the car operating panel.

B. Control and service switches, integral with car operating panel, shall include a keyed independent service switch, inspection key switch, keyed light switch, keyed fan switch, emergency light test switch, two (2) additional spare switch modules left blank for future use, and other control operating devices required to meet the requirements of the specification and/or Code. Adjustable volume electronic toners shall provide audible signaling of floor passing and car stop, and adjustable volume buzzers shall signal door delay and fireman emergency.

C. A hands-free telephone, and wiring from the telephone to terminals on the elevator controller, shall be provided in the car-operating panel. Others shall provide telephone wiring to the machine room controller location. The hands-free telephone shall be integral with the car operating panel and include instructions for use, a pushbutton to initiate the call, a microphone transmitter, a speaker and an acknowledge light to indicate when the call has been answered. The operation of the telephone shall automatically signal call acknowledgment and automatically reset on calls termination and not require any special action on the part of the operator. The telephone shall have the capability for ring-down use with an in-house telephone system or operate with a standard dial tone.

D. An LED digital readout position indicator shall be provided in each car operating panel, to indicate the position of the car in the hoistway, and include arrows to indicate the direction of travel of the car. The readouts shall be approximately 1.5" high.

E. A directional lantern with adjustable electronic toners shall be provided at each entrance at each floor. Directional lanterns shall signal once if a car is traveling in the Up direction and twice if in the Down direction and signal waiting passengers of the arrival of the next elevator and direction of travel.

F. An LED position indicator with direction of travel arrows shall be mounted integral with the hall lantern at each floor identified in the Equipment Summary. The numerals and the arrow shall be illuminated with sufficient intensity to permit easy reading of the indicator. The readouts shall be approximately 2" high.

G. Landing pushbutton fixtures containing Up and/or Down pushbuttons shall be provided at each floor. Illumination shall be provided in each button which shall light upon pressure registration of a call at that landing and be extinguished when a car responds to that call. Provide quality as listed in the Elevator Summary/Equipment Schedule. Pushbutton fixtures to be mounted at the recommended height for ADA requirements. Prior cutouts and/or boxes for existing hall stations can be utilized for extender type hall stations to meet this requirement. If extender type hall station fixtures are not utilized, the existing hall station cutout shall be filled and the wall surface finished matching the existing wall covering. No cover plates will be allowed. Include firesafing of all wall penetrations.

H. A Fireman/Emergency Operation key switch shall be located at the primary Fireman access floor elevator lobby and in the Fire Command Center to permit elevators to be recalled manually via operation of that key switch. The operation of the system and the location of the key switch will be determined by local Code requirements. The primary Fireman access floor and alternative floor shall be confirmed prior to fabricating the control or installing the key switch station.

I. All fixture faceplates shall be a minimum of 1/8" thick with a natural #4 brushed finish. All edges to be beveled on all sides of the faceplate. All finish grains to run in the longest direction of the plate.

J. The car station shall contain an emergency light fixture and power supply to operate it and the alarm bell in the event of loss of normal power.

K. All car and hall stations to conform to the ANSI A17.1-2013 Code for proper engraving and signage. All hall stations to be engraved with the “In Case of Fire” pictogram as designated in ANSI A17.1-2013 Figure 2.27.9.

L. All signal devices will also conform to the latest ADA requirements

2.30 POWER UNIT

A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit consisting of the following items:
   1. Oil reservoir with tank cover and controller compartment with cover.
   2. An oil hydraulic pump.
   3. An electric motor.

4. Oil control unit with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and magnetic controller.

B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.

C. Drive: Drive shall be by direct coupling with the pump and motor submerged in the oil reservoir or by multiple V-belts and sheaves of number and size to insure maximum factor of safety. Drive type shall be determined based primarily on the load on the car, travel, and speed.

D. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating shall comply with specified speeds and loads.

E. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
   1. Relief valve shall be externally adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
   2. Up start and stop valve shall be externally adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.
   3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
   4. Lowering valve and leveling valve shall be externally adjustable for drop-away speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling when slowdown is initiated.
   5. Manufacturer of the pumping unit to provide their perspective on using biodegradable fluids for their equipment. Contractor to provide cost to provide same as an alternate to be considered by Owner.

2.31 JACK UNIT

A. The existing jack units will be completely removed. The existing cylinder hole will be cleaned to the proper depth and diameter to accept the new cylinder and continuous PVC sleeve protection. If the existing hole has to be enlarged the contractor will provide all labor and material to enlarge the hole and remove the spoils at no extra charge to the Owner.

B. Jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to insure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Jack unit shall consist of the following components:

C. All evacuation spoils removed by the contractor and/or their agents, will be placed in 55 gallon drums at the site. The spoils shall be tested by the contractor using a Hazmat remediation sub-contractor who will deliver a report on their findings.
   1. Stainless steel tubing
   2. Stop ring shall be electrically welded to the plunger to prevent plunger leaving the cylinder.
   3. Internal guide bearing
   4. Packing or seal of suitable design and quality.
   5. Drip ring around cylinder top.
   6. Cylinder made of steel pipe and provided with a pipe connection and air bleeder.
   7. Weld brackets to the jack cylinder for supporting the elevator on pit channels.
   8. An auxiliary safety bulkhead shall be provided in the lower end of the cylinder.
   9. Corrosion protection for the jack cylinder by encasing the entire length of the cylinder below ground with a PVC plastic auxiliary casing with approved monitoring device.

2.32 MACHINE LOCATION

A. The Elevator Contractor shall survey the existing machine room location for size and accessibility. The Elevator Contractor shall submit a drawing of the new machine room showing the location of the new equipment installed and this drawing shall be signed and sealed by a registered engineer of the State of West Virginia. A sign shall be placed in the elevator machine room indicating the strength of the floor as detailed in ANSI A17.1, Rule 2.1.3.3.

2.33 CAR FRAME AND SAFETY

A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood subfloor. Underside of the platform shall be fireproofed. The platform for the freight car shall be of a sufficient design to handle freight C-1 loading.

B. Sling: Steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.

2.34 GUIDE RAILS

A. New 15# rails shall be provided for the passenger car. The freight car will receive 31# rails. Proper bracket, spacing and channel backing will be provided.

2.35 ROLLER GUIDES

A. Roller guide assemblies shall be provided on the passenger car. Each roller guide assemblies shall consist of three (3) roller wheels of a durable resilient material rotating on a sealed ball bearings and mounted on a substantial base to permit continuous contact with the machined running surfaces of the guide rails. Roller guides will be provided with adjustable stops.

2.36 BUFFER SPRINGS

A. New spring buffers shall be supplied in the pit for car. Buffer assemblies shall be installed at the proper height to allow for suitable compression and to maintain sufficient clearances for run-by as required by Code.

B. Data plates shall be affixed as required by Code.

C. Buffers and buffer mounting channels, stands and platforms shall be painted with rust inhibiting paint.

2.37 HOISTWAY ENTRANCES

A. Doors and Frames: Provide complete hollow metal type UL rated hoistway door panels at each hoistway opening.
   1. Manufacturer's standard replacement entrance door panel design consisting of 16 gauge doors, hangers, hanger supports, hanger covers, fascia plates, sight guards, and necessary hardware.
   2. Elevator wall interface with hoistway entrance assembly shall comply with elevator manufacturer's requirements.
      a. Doors: Flush construction
      b. Steel: ASTM A 366 steel panels, factory-applied baked enamel finish..
      c. Frames: Formed construction.
      d. Steel: ASTM A 366 formed steel, factory-applied baked enamel finish.

B. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.

C. Door Hanger and Tracks: Provide sheave type two point suspension hangers and tracks for each hoistway sliding door.
   1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
   2. Hangers: Provide an adjustable slide to accommodate the up-thrust of the doors.
   3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

D. Hoistway Sills: To be reused, cleaned and refinished.
   1. Aluminum: ASTM B 221 aluminum, mill finish.

E. Fire stops shall be provided on each panel. Floor numbers will be painted six (6) Inches high on the inside of each respective floor door panel.

F. Headers and struts to support the new door track assemblies shall be provided.

G. Floor identification jamb plates shall be provided on each side of each entrance frame at 60 inches above the finished floor line. Each plate shall be a minimum of four (4) inches square, black background with stainless steel characters.

2.38 DOOR OPERATOR

A. Passenger Elevator:

B. A motor driven heavy-duty door operator with closed loop control system and all electronic and digital operation shall be provided. The door operator shall be mounted on the car top and shall open and close at the car door and hatch door simultaneously at any landing through the use of roller release assemblies and clutch assemblies.

C. The closed loop control shall give constant feedback on position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based upon the position and load of the door. The operator will be adjusted by using a hand-held keypad programmer where adjustment will be stored in the keypad and downloaded to another operator.

D. The operator shall contain test switches for open, close, nudging and speed zone set-up.

E. The control box housing of the electronic components for the operator will be made of material and seals to be water-resistant.

2.39 PROXIMITY EDGE:

A. A stationary proximity detector shall be installed on the car door between the leading edge of the car door and the landing door. The detector shall include a full curtain array of LED lightrays to fully cover the entire opening and be so arranged that, should an obstruction cross the plane of the array of beams, the car doors shall automatically reverse to the open position. Upon reopening, the doors shall remain open for a predetermined amount of time or stay open until the obstruction is cleared. If the obstruction remains in the path of the car door for an adjustable period of time, an adjustable volume buzzer shall continuously sound until the doors are released and allowed to fully close at a reduced rate of speed less than 2 ½ foot pounds.

2.40 ELEVATOR CAB ENCLOSURE

A. Elevator Cab:
   1. A new cab enclosure shall be provided. The cab will be of steel construction with flush wall plastic laminate selected by the Owner. The return, car door, and transom will be constructed of #4 stainless steel. The cab will have pad button of stainless steel, a single speed fan, a certificate frame, one (1) sets of pads per, handrails and bump rails on the sides and rear wall, new rubber non-slip bubble type flooring tile, vents, emergency exit with switch. The contractor shall submit samples or pictures of the cab to be installed.
   2. The car enclosure shall consist of not less than 14 gauge sheet metal wainscot the full height of the elevator cab. Top of the car shall be set in an angle iron frame with an 18" hinged section at each loading edge. All enclosures shall be strongly braced, reinforced per the ANSI A17.1-2013 requirements and finished in spray enamel. Car enclosure shall have a headroom clearance of eight feet per the existing cab structure. The car will have at least two (2) LED strip light fixtures so as to maintain a minimum of 25ft. candles of light at floor level. FIxtures will be IP67 with removable safety cage.
   3. All elevator cab appliances shall conform to electrical efficiency requirements of Standard 90.1 (Section 10.4.3).
   4. Lighting: For the luminaries in the elevator cab, not including signal equipment and emergency lighting, the sum of the lumens (lm) divided by the sum of the watts shall be no less than 35/lm/W.

5. Ventilation: Cab ventilation fan for elevator shall not consume over 0.33W/cfm at the maximum speed.
6. Standby Mode: When cab is stopped and unoccupied with doors closed for 15 minutes, cab interior lighting and ventilation shall be de-energized until required for operation.

2.41 ELECTRIC WIRING

A. New wiring and conduit and wiring troughs to be installed on this installation. All wiring shall conform to the latest edition of the NEC Code.

B. Each traveling cable shall include a minimum of three (3) pairs of twisted shielded wires for use by a building security and/or communication system, one (1) coax cable, two CAT 6 cable, and any other special wiring as may be required to accommodate telephone, security, and fire requirements.. All travelling cables shall be rated for elevator duty.

C. A minimum of fifty (50) percent spares shall be provided for all traveling cables and hoistway cables.

D. An emergency alarm bell shall be installed on the car top, and outside the hoistway at the lowest landing.

E. All interlock wiring shall be Teflon insulated, or as required by Code.

F. New main line disconnects shall be installed as part of this contract by a licensed electrician with a master's electrician's license. These disconnects shall be located on the lock side of the machine room door and within sight of all equipment.

G. New 110 v. single-phase lighting disconnects shall be installed next to the new main line disconnects. Disconnects shall be lockable and installed according to the latest NEC code.

2.42 PAINTING

A. The elevator equipment room floor and pit floor shall be painted with two coats of deck enamel, after final adjusting. Refuge space on car top and in pit shall be painted a contrasting color.

B. All exposed ferrous metal surfaces of machines, motors, controllers, and any other equipment installed or retained, shall receive a coat of rust inhibiting paint. After installation, the equipment shall receive a final coat of paint.

C. The existing door frames of both elevators shall be sanded and filled and receive a coat of primer and paint applied electrostatically and not painted by hand.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine elevator areas for compliance with requirements for installation tolerances and other conditions affecting performance and/or compliance with these specifications. Examine hoistway, hoistway openings, pits, and machine rooms as constructed: verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PROJECT MANAGEMENT AND SUPERVISION

A. Designate an experienced Project Manager to perform the administrative management of this project and place a competent Superintendent in charge of the project throughout the course of the work. Assign an on-site job Foreman to be responsible for day to day operations and scheduling with the Owner. Make available the Project Manager and Superintendent to assist in the progress and coordination of the work of the project in all matters relating to the project.

3.03 MATERIALS

A. Coordinate with the Owner for suitable storage of all materials, road boxes, and tools. Contractor to maintain insurance for all tools and equipment and shall be responsible for the safe keeping of it.

B. Protect equipment and exposed finishes during transportation, erection, and construction against damage.

3.04 HOISTING, HANDLING AND INSTALLATION OF EQUIPMENT

A. Install all equipment according to manufacturer's recommendations.

B. Install all equipment with proper clearances complying with referenced and applicable codes and specifications.

C. Install all items so that they are safely accessible for maintenance and so that they may be removable via portable hoist or other means for maintenance and repair.

D. Contractor shall be responsible for all hoisting of all equipment involved in this installation.

3.05 TESTS

A. A full load acceptance test will be performed upon completion.

B. The elevator will be inspected by the Department of Labor of West Virginia certified Q.E.I. inspector and/or by a qualified Q.E.I. as designated by the Department of General Services, prior to acceptance and turning the elevator over to building service.

C. All tests shall conform to ANSI A17.1 §8.10.2 and 8.10.3 with appropriate documentation as to tags and records outlined in this code.

3.06 DEMONSTRATION AND INSTRUCTION TO OWNER

A. Demonstrate operation of elevators to Owner's personnel, and designees, and provide instructions in the proper use, operation and daily maintenance of the elevators.

B. Review emergency procedures for entrapments with the Owner's representative, and designees. Train Owner's representative, and designees, in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner and designees on requirements and checklists to complete an elevator maintenance program.

3.07 SPECIAL TOOLS AND INSTRUCTIONS AND TOOL MAINTENANCE

A. Upon completion of the project, provide one (1) set of any diagnostic tools and computers, including all manuals, codes, passwords, accessories and sundries necessary to operate the diagnostic tools and computers, in order to test, adjust, maintain and troubleshoot the elevator equipment provided and for diagnostic evaluations and system monitoring. Instructions shall be provided for the operation of the diagnostic tools and computers and for all functions relating to testing, adjusting and maintenance. Diagnostic tools and computers provided to the Owner shall be capable of performing all levels of diagnostic; systems adjustments and software program changes which are available to the Elevator Contractor.

B. Provide to the Owner periodic update, maintenance, recalibration and/or reinitiating of diagnostic tools, computers and accessories upon request from the Owner, for a period of ten (10) years from the date of final acceptance of the elevator, regardless of whether the Elevator Contractor is the maintenance contractor for the elevator. Provide the Owner with a loaner diagnostic tool or computer at no cost to the Owner, should the Owner's tool or computer be required to be replaced, recalibrate or reinitiated, until the Owner's original tool or computer is returned.

C. Provide to Owner three (3) bound sets of printed instructions for use of any tool or computer that may be necessary to perform diagnostic evaluations, system adjustment, maintenance troubleshooting and/or programmable software changes on any unit of the control equipment, including access codes, passwords and other information necessary to interface with microprocessor control equipment. In addition, provide step by step adjusting, programming and troubleshooting procedures and a composite listing of the individual settings chosen for the variable software parameters stored on the software programs of motion and dispatch controller and motor drives.

D. Provide field and technical assistance and instructions to the Owner, upon, within a reasonable time following the Owner's request.

3.08 REFERENCE MAINTENANCE CHECKLIST

A. Elevator Maintenance Checklist

1. Inside The Car
   Sweep clean door guides & channels ensure smooth operation of door movement.
   Inspect car interior for ceiling, wall and handrail damage or lose mountings.
   Inspect all light functions and replace bulbs.
   Test Emergency Stop button for functionality.
   Confirm emergency phone is functioning and audible speakers are working clearly.
2. Outside the Car
   Replace any lights that are not functioning.
   Inspect the door panels and clearances as well as Hoist way doors.
   Check floor of car to remain flush with landing not exceeding ½" variance.
3. Machine Room
   Check lubrication schedules and levels and top off as necessary.
   Check for frayed cables running full length of car travel to all floors.
   Electrical inspection tighten all connections, observe loose connections.
   Visually inspect for any wiring discoloration or evidence of overheating.
   Hydraulics fluid level and potential leaks visual inspection.
4. Pit Inspection
   Inspect Car Buffer for oil leakage or spring over compression for car and counterweights.
   Clean out and sweep floor.
   Inspect sump and pump operation for unrestricted flow.
5. Top of Car
   Ensure the emergency hatch is functional and easily accessible.
   Test the brakes and inspect shoes, no signs of shavings or metal dust.
   Inspect the pit for proper clearances.
   Inspect the car frame for any signs of damage or cracks in welded joints.
6. Any other requirements by the manufacturer related to monthly maintenance, required in the manufacturer's I,O,M Manual will be added to the above.

7. Notes: _____

   _____

   _____

8. TECHNICIAN:_____

9. Owner acceptance:_____

END OF SECTION

SECTION 14 2810

ELEVATOR MONITORING & SUPERVISORY CONTROL SYSTEM (EMSCS)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elevator Monitoring & Control Software.

B. Hardware.

1.02 RELATED REQUIREMENTS

A. Section 14 2143: Electric Traction Elevator Modernization.

B. Section 14 2401: Hydraulic Elevator Modernization (Full).

C. Section 14 2402: Hydraulic Elevator Modernization (Partial).

1.03 ADMINISTRATIVE REQUIREMENTS

A. The installation of the EMSCS will be coordinated with the installation of the other elevator components. The project is a phased installation and the EMSCS will be installed in a manner to match the phasing of the project. Refer to the Narrative Scope of Work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide detailed information regarding software and hardware requirements. Include software capability including number of users, event logging, view & control capabilities, etc..
   1. Provide color screenshots of sample software interface graphics.

C. Operation and Maintenance Data: Provide operations and installation manual of software.
   1. Provide (3) hard copies bound in three ring biders.
   2. Provide (3) electronic copies via USB flash drive or compact disc.

D. Executed warranty: Provide a sample copy of executed warranty for software and equipment. Warranty should reference specific warranty periods indicated in the project narrative.

E. Project Record Documents: Indicate actual locations of interfacing equipement including data termination locations.

F. Software: Copy of software required in this section, associated licensing documentation, and support contact information. Indicate that licensing is in the Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store interfacing equipment and other hardware in a location free from construction damage and dust until ready for installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Warranty: Provide a warranty for each elevator location. Refer to Narrative Scope of Work for warranty requirements. Warranty period for each elevator location varies in accordance with the Narrative Scope of Work.
   1. Any software maintenance including updates and security patches issued during the warranty period will be installed at no additional cost.

2. The warranty for each system incorporated at each system's substantial completion will extend from that substantial completion to the end of the project warranty period, as defined in the project documents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Integrated Design Systems, Lift-Net; www.lift-net.com, or equal.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ELEVATOR MONITORING & SUPERVISORY/CONTROL SYSTEM (EMSCS)

A. The EMSCS will be remote access via web based deployment on the Owner's virtual servers. It will view, alarm, schedule the systems and provide overarching control of the systems which can be enabled or disabled.
   1. The system shall be capable of interfacing with all makes and models of elevators. The system shall collect data via serial data link to microprocessor based elevator controllers.
   2. It will be turn key installation.

B. Hardware:
   1. Machine Room Interface Panels
      a. Input Voltage Range: 5-250V AC/DC.
      b. Power Requirements: 90-230VAC, 50/60Hz, 3A.
      c. Ambient Conditions: 45-112°F, 10-85% RH, con-condensing.
      d. Modular Design: Panels to be modular to allow for expansion capability.
      e. Inputs: Oprical isolation: >3,500 VRMS @ 1 sec.
      f. Outputs: Relay form "C" contact rated 1/3 HP inductive, 3A, 250VDC.
      g. Accessories: Provide additional interfacing equipment necessary to communicate with elevator control equipment.

C. Network Capability:
   1. Web-Based Deployement: Software to be web-based deployment. Software to be installed on owner's virtual servers. Coordinate with the Owner's Office of Information Technology for hosting requirements on Owner's servers.
   2. Minimum Number of Nodes (cobined PC, elevator): 500.
   3. Minimum I/O points per node: 2,040.
   4. Access time to status bit change: <25ms.
   5. Must be able to operate on the following network types:
      a. RS485.
      b. RS422.
      c. Ethernet.
      d. Token Ring.
      e. Arc-Net.
      f. Lift-Net.
      g. Fiber-optic.
      h. WAN.
      i. TCPIP.

D. Software Interface:
   1. Web based application to be accessed via web browser from the local network or from a remote location via VPN/internet.
      a. Provide for a minimum of (5) distinct users. No annual user licenses, software renewal fees, or subscription servivces will be allowed for continued use of the software or interfaces.
      b. Network entry to be multi-level password protected.

E. Display:
   1. System to be capable of displaying all elevators in a facility on a single screen.
   2. The system shall display and record the follwowing data points for each elevator:

a. Group operation mode.
b. In/out of service.
c. In/out of group service.
d. Emergency power.
e. Supervisory failure.
f. Location and direction of hall calls.
g. Direction of travel.
h. Independent service.
i. Inspection service.
j. Fire service.
k. Position of elevator.
l. Door status.
m. Door dwell time.
n. Load bypass.
o. Power on/off.
p. Door detector.
q. Safety circuit.
r. Door zone.
s. Stop switch.
t. Alarm button.
u. Registered call calls.

3. Allow user control via software of the following:
   a. Floor lockout.
   b. Lobby recall.
   c. VIP service.
   d. Fireman's service.
   e. Up/down peak.
4. Monitor the following faults:
   a. Safety circuit.
   b. Alarm bell.
   c. Door reversal device.
   d. Earthquake.
   e. Any faults which will render the unit inoperable.
5. Reports: Provide reports in color graphical format both on-screen and printed on paper. Reports to be diplayed after minimal wait time. Data for all reports to be continuously recorded and stored. Reports to be displayed by selecting a time and date range, bank of equipment, and report type. Reports to be availlabe and grouped as follows:
   a. Traffic Reports
      1) Number of hall calls per floor.
      2) Number of hall calls per hour.
      3) Hall call wait times per floor.
      4) Hall call wait times per hour.
      5) Distributed hall call response graph.
      6) Longest wait times.
   b. Fault Reports
      1) Ten most recent faults.
      2) Fault Log - Displays entire fault log for given time period.
      3) Faults per car.
      4) Faults per floor.
      5) Faults per day.
   c. Car Use Statistics
      1) Car use by hour (calls, starts, door cycles, delayed car, load bypass).
   d. Group Service Log
      1) Cars in service.

2) Indicator of percent time in useful service
3) Group functions.

F. Paging Feature: System shall be capable of sending alerts via email or text upon triggering of faults or alarms.
1. Include a prioritized email notification system which routes emails to different email recipients depending on priority of message (i.e. emergency, urgent, routine, etc.).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that elevator systems are installed and operational. Ensure data cabling is installed, terminated, and Owner's Ofiice of Information Technology has mapped data locations.

3.02 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

B. Install machine room interface panels in a manner to not interfere with maintenance and operation clearances of other equipment or in locations not approved by applicable building codes.

C. Install any auxilliary hardware components necessary to interface with elevator controller. Coordinate with installers of elevators.

D. Each incorporation of a project elevator system will be integrated into the EMSCS no later than when each individual system is substantially complete, as defined in the contract documents, no exceptions.

E. Install (2) Cat6a jacks in each machine room and route cabling to the IDF rooms as indicated in the project documents. The jack end will be punched down, the IDF end will be left with a 20 foot whip in the location designated by the owner for punch down by the Owner's personnel. Cabling must be routed concealed and may not damage the finishes of the building. It will be secured to structure and not to other wiring, conduit, or equipment.

F. Terminate data cabling at interface panels.

G. Install software on Owner's remote server. Obtain all permissions necessary by the Owner's Office of Technology.

H. Should individual users licenses be required by the software, the Project will provide 12 full function user licenses or "seats", fully licensed to the Owner for a period of 6 years from the date of Project Substantial Completion. Similarly any server licenses, or other EMSCS licenses required to deploy and operate the system will be fully licensed to the Owner for a period of 6 years from the date of Project Substantial Completion. Any costs associated with obtaining, registering, or transferring such licenses for or to the Owner is part of the project. This is both a project and warranty requirement.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.04 SYSTEM STARTUP

A. Manufacturer Services: Provide services of manufacturer's field representative to perform systems startup.

B. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.

C. Provide on site programming support as necessary to program and interface all elevator controllers to the software. Multiple programming trips will be necessary as the elevators are installed in a phased construction manner. Coordinate programming schedule with other trades.

D. Test the software after each elevator modernization to ensure each elevator is properly interfaced to the software.

3.05 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals for additional submittals.

B. See Section 01 7900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

D. Training: Owner training on the EMSCS is a project requirement. Training will occur at a separate and distinct time from demonstration. Demonstration must be completed prior to the scheduling of training. Two training sessions will be held on two separate occasions in the project, for a total of four sessions. The sessions on each occasion will be scheduled on successive days and will each train 6-8 of the Owner's personnel or designees. Session one will occur at the substantial completion of the first elevator system in the project (projected to be elevator #1 in Building #7). The second training session with occur in month 11 of the project warranty period. Sessions will be of sufficient length, detail, and of a nature to fully convey the configuration, hardware, software, operations, and troubleshooting of the systems. A detailed training syllabus will be provided to the Engineer, for approval, prior to the performance of training. All training materials will be provded and will be utilized as refereence during the training.

END OF SECTION

SECTION 21 1300

FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; current edition.

B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. Shop Drawings:
   1. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
      a. Prior to bidding, the contractor is to field verify existing piping nearby the limits of added & modified fire protection. The contractor may add addiitonal coverage to existing piping provided they filed verify existing conditions and perform calculations to confirm tapping existing piping is acceptable. These calculations will be submitted as part of the WVSFM office submission.
   2. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Architect (Engineer).

D. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.

E. Designer's Qualification Statement.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

H. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
   3. Sprinkler Wrenches: For each sprinkler type.

J. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

1.03 QUALITY ASSURANCE

A. Comply with FM (AG) requirements.

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

C. Equipment and Components: Provide products that bear FM (AG) label or marking.

D. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sprinklers, Valves, and Equipment:
   1. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SPRINKLER SYSTEM

A. Sprinkler System: Provide coverage for projects areas as indicated. Modify existing system to meet current applicable codes and accomodate new elevator systems.

B. Occupancy: Ordinary hazard, Group 1; comply with NFPA 13. Verfiy with AHJ prior to commencing work.

C. Water Supply: Determine volume and pressure from water flow test data.
   1. Test flows to determine sufficiency of existing system for modification.

D. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.03 SPRINKLERS

A. Suspended Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Chrome plated.
   4. Escutcheon Plate Finish: Chrome plated.
   5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

B. Exposed Area Type: Pendant type with guard.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Chrome plated.
   4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.

B. Install equipment in accordance with manufacturer's instructions.

C. Place pipe runs to minimize obstruction to other work.

D. Place piping in concealed spaces above finished ceilings.

E. Flush entire new piping system of foreign matter.

F. Fully test modified system as directed by AHJ.

G. Acceptance test will be by WV State Fire Marshal.

END OF SECTION

SECTION 22 0001

BASIC PLUMBING MATERIALS AND METHODS

GENERAL REQUIREMENTS

1.01 CONFORM TO THE CURRENT REQUIRMENTS OF THE IMC AND IPC - 2015

1.02 PERFORM ALL WORK UNDER THIS SECTION IN ACCORDANCE WITH APPLICABLE CODES & STANDARDS AND BEST INDUSTRY AND TRADE PRACTICES.

1.03 COORDINATE ALL WITH OTHER TRADES PRIOR TO BIDDING. THIS IS A RENOVATION PROJECT.

1.04 BY SUBMISSION OF A BID, THE CONTRACTOR REPRESENTS THAT THEY HAVE THOROUGHLY REVIEWED THE DOCUMENTS, THESE SPECIFICATIONS, AND THE PROJECT SITE IN SUFFICIENT DETAIL AND THAT THE BID REPRESENTS THE WORK NECESSARY FOR A FULLY OPERATIONAL SYSTEM. THE BID SUBMISSION ALSO REPRESENTS THAT THE CONTRACT HAS BEEN AFFORDED REASONABLE OPPORTUNITY TO ASK QUESTIONS AND RECEIVED ANSWERS IN WRITING; SHARED WITH ALL BIDDERS.

1.05 SUSPECT MATERIAL: SHOULD THE CONTRACTOR ENCOUNTER SUSPECTED ACM MATERIAL, THEY ARE TO STOP WORK IN THE AFFECTED AREA AND NOTIFY THE OWNER AND ENGINEER. THE OWNER WILL ARRANGE FOR TESTING IF THE EXISTING ACM DOCUMENTATION IS UNCLEAR. REMEDIATION OF ACM IS NOT INCLUDED IN THIS PROJECT SCOPE BY THE CONTRACTOR.

1.06 THE APPROVED SCHEDULE WILL NOT BE MODIFIED EXCEPT BY APPROVAL OF THE ENGINEER. WITH EACH PAY APPLICATION, THE SCHEDULE WILL BE HAND MARKED TO INDICATE PROGRESS DEVIATIONS FROM THE SCHEDULE. THE DEVIATIONS WILL BE REVIEWED BY THE ENGINEER AND OWNER AND THE CONTRACTOR WILL DEVELOP A PLAN TO RETURN TO THE SCHEDULED WORK FLOW AT NO ADDITIONAL COST TO THE PROJECT. BY SUBMITTING A BID, CONTRACTOR ACKNOWLEDGES UNDERSTANDING OF GENERAL AND SUPPLEMENTAL CONDITIONS OF THIS PROJECT AS IT PERTAINS TO FAILURE TO PERFORM.

MATERIALS & METHODS

2.01 BUILDING SERVICES PIPING

A. Information for Specific Systems:
   1. System Pressures: Specified in other Sections.
   2. Pipe and Fitting Applications: Indicated on drawings; materials specified in 22 1005.
   3. Valve Types and Applications: Indicated on drawings; general requirements specified in 22 1005.
   4. Specialties: Indicated on drawings; general requirements specified in 22 1006.
   5. Sections Where Other Requirements are Specified:
      a. Sanitary Sewer and Vent: Section 22 1005.

2.02 PIPES AND TUBES

A. Steel Pipe:
   1. Black Steel Pipe: ASTM A 53/A 53M, Schedule 40, without galvanizing.

END OF SECTION

SECTION 22 1005

PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, specialties, and connections for piping systems.
   1. Sanitary sewer.
   2. Domestic water.
   3. Storm water.
   4. Gas.
   5. Flanges, unions, and couplings.
   6. Pipe hangers and supports.
   7. Ball valves.
   8. Valves.
   9. Check.
   10. Propane.

1.02 REFERENCE STANDARDS

A. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV; 2011.

B. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV; 2012.

C. ASME B31.9 - Building Services Piping; 2014.

D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Qualifications; 2015.

E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999 (Reapproved 2014).

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

G. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

H. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.

I. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2013.

J. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2010.

K. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2002 (Reapproved 2010).

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

M. AWWA C606 - Grooved and Shouldered Joints; 2011.

N. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; 2009.

O. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2011.

P. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements; 2012.

Q. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2013.

R. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

S. MSS SP-71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends; 2011.

T. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.

U. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.

V. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).

W. NSF 372 - Drinking Water System Components - Lead Content; 2011.

X. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Valve Repacking Kits: One for each type and size of valve.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.

D. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.06 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY SEWER PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A).
   1. Fittings: ASME B16.29, wrought copper, or ASME B16.23, sovent.
   2. Joints: ASTM B32, alloy Sn50 solder.

2.03 STORM WATER PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.04 FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 Inches and Under:
   1. Ferrous Pipe: Class 150 malleable iron threaded unions.
   2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

B. Flanges for Pipe Size Over 1 Inch:
   1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
   2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
   1. Dimensions and Testing: In accordance with AWWA C606.
   2. Housing Material: Provide ASTM A47/A47M malleable iron or ductile iron, galvanized.
   3. Gasket Material: Nitrile rubber suitable for operating temperature range from minus 20 degrees F to 180 degrees F.
   4. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
   5. When pipe is field grooved, provide coupling manufacturer's grooving tools.

D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.05 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
   4. Vertical Pipe Support: Steel riser clamp.
   5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
   6. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
      a. Bases: High-density polypropylene.
      b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
      c. Steel Components: Stainless steel or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
      d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion-resistant material.
      e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.

B. Plumbing Piping - Drain, Waste, and Vent:
   1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
   3. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
   4. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
   5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

C. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
   1. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
   2. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
   3. Other Types: As required.

2.06 BALL VALVES

A. Manufacturers:
   1. Conbraco Industries, Inc: www.apollovalves.com.
   2. Nibco, Inc: www.nibco.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded or grooved ends with union.

2.07 SWING CHECK VALVES

A. Manufacturers:
   1. Nibco, Inc: www.nibco.com.
   2. Conbraco Industries: www.apollovalves.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Up to 2 Inches:
   1. 1, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder ends.

C. Over 2 Inches:
   1. 1, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged or grooved ends.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed.

H. Install bell and spigot pipe with bell end upstream.

I. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

J. Sleeve pipes passing through partitions, walls, and floors.

K. Inserts:
   1. Provide inserts for placement in concrete formwork.

L. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as indicated.

3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
4. Place hangers within 12 inches of each horizontal elbow.
5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
8. Provide copper plated hangers and supports for copper piping.
9. Provide hangers adjacent to motor-driven equipment with vibration isolation.

3.04 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

D. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Provide spring-loaded check valves on discharge of water pumps.

3.05 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

3.06 SCHEDULES

A. Pipe Hanger Spacing:
   1. Metal Piping:
      a. Pipe Size: 1/2 inches to 1-1/4 inches:
         1) Maximum Hanger Spacing: 6.5 ft.
         2) Hanger Rod Diameter: 3/8 inches.
      b. Pipe Size: 1-1/2 inches to 2 inches:
         1) Maximum Hanger Spacing: 10 ft.
         2) Hanger Rod Diameter: 3/8 inch.
      c. Pipe Size: 2-1/2 inches to 3 inches:
         1) Maximum Hanger Spacing: 10 ft.
         2) Hanger Rod Diameter: 1/2 inch.
      d. Pipe Size: 4 inches to 6 inches:
         1) Maximum Hanger Spacing: 10 ft.
         2) Hanger Rod Diameter: 5/8 inch.
   2. Plastic Piping:
      a. All Sizes:
         1) Maximum Hanger Spacing: 6 ft.

END OF SECTION

SECTION 22 3000
PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submersible sump pumps.

B. Pumps.

1.02 REFERENCE STANDARDS

A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015.

B. ABMA STD 11 - Load Ratings and Fatigue Life for Roller Bearings; 1990 (Reapproved 2008).

C. ICC (IPC) - International Plumbing Code; 2015.

D. NEMA MG 1 - Motors and Generators; 2014.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 778 - Standard for Motor-Operated Water Pumps; Current Edition, Including All Revisions.

1.03 REFERENCE STANDARDS

A. ANSI Z21.10.1 - Gas Water Heaters - Volume I - Storage Water Heaters with Input Ratings of 75,000 Btu per Hour or Less; 2011.

B. ANSI Z21.10.3 - Gas-Fired Water Heaters - Volume III - Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating and Instantaneous; 2014.

C. UL 174 - Standard for Household Electric Storage Tank Water Heaters; Current Edition, Including All Revisions.

D. UL 1453 - Standard for Electric Booster and Commercial Storage Tank Water Heaters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data:
   1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
   2. Indicate pump type, capacity, power requirements.
   3. Provide certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
   4. Provide electrical characteristics and connection requirements.

C. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

E. Project Record Documents: Record actual locations of components.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Pump Seals: One of each type and size.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

B. Identification: Provide pumps with manufacturer's name, model number, and rating/capacity identified by permanently attached label.

C. Performance: Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, operate within 25 percent of midpoint of published maximum efficiency curve.

1.07 CERTIFICATIONS

A. Water Heaters: NSF approved.

B. Gas Water Heaters: Certified by CSA International to ANSI Z21.10.1 or ANSI Z21.10.3, as applicable, in addition to requirements specified elsewhere.

C. Electric Water Heaters: UL listed and labeled to UL 174 or UL 1453.

D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for domestic water heaters.

PART 2 PRODUCTS

2.01 SUBMERSIBLE SUMP PUMPS

A. Manufacturers:
   1. Zoeller Company: www.zoeller.com/#sle.
   2. Liberty Pumps: www.libertypumps.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Type: Completely submersible, vertical, centrifugal.

C. Casing: Cast iron pump body and oil filled motor chamber.

D. Impeller: engineered polymer; open non-clog, stainless steel shaft.

E. Bearings: Ball bearings.

F. Accessories: Oil resistant 6 foot cord and plug with three-prong connector for connection to electric wiring system including grounding connector.

G. Servicing: Slide-away coupling consisting of discharge elbow secure to sump floor, movable bracket, guide pipe system, lifting chain and chain hooks.

H. Controls: Integral vertical magnetic float type level controls with separate liquid level control high level alarm.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions of certification, if any.

B. Coordinate with plumbing piping and related fuel piping work to achieve operating system.

C. Pumps:
   1. Provide line sized isolating valve and strainer on suction and line sized soft seated check valve and balancing valve on discharge.
   2. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge line sizes 4 inches and over.

3. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
4. Align and verify alignment of base mounted pumps prior to start-up

END OF SECTION

SECTION 23 0001

BASIC MECHANICAL MATERIALS & METHODS

GENERAL REQUIREMENTS

1.01 CONFORM TO THE CURRENT REQUIRMENTS OF THE IMC AND IPC - 2015

1.02 PERFORM ALL WORK UNDER THIS SECTION IN ACCORDANCE WITH APPLICABLE CODES & STANDARDS AND BEST INDUSTRY AND TRADE PRACTICES.

1.03 COORDINATE ALL WITH OTHER TRADES PRIOR TO BIDDING. THIS IS A RENOVATION PROJECT.

1.04 BY SUBMISSION OF A BID, THE CONTRACTOR REPRESENTS THAT THEY HAVE THOROUGHLY REVIEWED THE DOCUMENTS, THESE SPECIFICATIONS, AND THE PROJECT SITE IN SUFFICIENT DETAIL AND THAT THE BID REPRESENTS THE WORK NECESSARY FOR A FULLY OPERATIONAL SYSTEM. THE BID SUBMISSION ALSO REPRESENTS THAT THE CONTRACT HAS BEEN AFFORDED REASONABLE OPPORTUNITY TO ASK QUESTIONS AND RECEIVED ANSWERS IN WRITING; SHARED WITH ALL BIDDERS.

1.05 SUSPECT MATERIAL: SHOULD THE CONTRACTOR ENCOUNTER SUSPECTED ACM MATERIAL, THEY ARE TO STOP WORK IN THE AFFECTED AREA AND NOTIFY THE OWNER AND ENGINEER. THE OWNER WILL ARRANGE FOR TESTING IF THE EXISTING ACM DOCUMENTATION IS UNCLEAR. REMEDIATION OF ACM IS NOT INCLUDED IN THIS PROJECT SCOPE BY THE CONTRACTOR.

1.06 THE APPROVED SCHEDULE WILL NOT BE MODIFIED EXCEPT BY APPROVAL OF THE ENGINEER. WITH EACH PAY APPLICATION, THE SCHEDULE WILL BE HAND MARKED TO INDICATE PROGRESS DEVIATIONS FROM THE SCHEDULE. THE DEVIATIONS WILL BE REVIEWED BY THE ENGINEER AND OWNER AND THE CONTRACTOR WILL DEVELOP A PLAN TO REUTRN TO THE SCHEDULED WORK FLOW AT NO ADDITIONAL COST TO THE PROJECT. BY SUBMITTING A BID, CONTRACTOR ACKNOWLEDGES UNDERSTANDING OF GENERAL AND SUPPLEMENTAL CONDITIONS OF THIS PROJECT AS IT PERTAINS TO FAILURE TO PERFORM.

MATERIALS & METHODS

2.01 PIPES AND TUBES

A. Copper Pipe: ASTM B 42, hard drawn, with ASME B16.18 or ASME B16.22 fittings and soldered joints, or ANSI/ASME B16.26 fittings and flared joints.

B. Steel Pipe:
   1. Black Steel Pipe: ASTM A 53/A 53M, Schedule 40, without galvanizing.

2.02 VALVES

A. Ball Valves: Bronze two piece body, SS stem and internals, and Class 125; threaded or soldered ends; MSS SP-110.

B. Drain Valves: Bronze body, screwed bonnet, rising stem, composition disc, 3/4 inch (19 mm) outlet connection, Class 125; threaded or solder ends.

C. Temperature and Pressure Relief Valves: Cast iron, bronze or steel body, stainless steel or bronze trim, direct spring loaded, lifting level, and ASME Unfired Pressure Vessel Code stamp.

2.03 PIPING SPECIALTIES

A. Unions: Screwed type for pipes 2-1/2 inches (63 mm) and smaller; flanged type for pipes 3 inches (75 mm) and larger.

B. Automatic Air Vents:
   1. 150 psig (1034 kPa) or Less: Cast brass body with stainless steel float and valve pin; 3/4 inch (19 mm) inlet.

C. Bladder Type Expansion Tanks: ASME stamped steel shell with removable bladder, flanged connection for insertion of bladder, and lifting rings; factory primed and enamel finished.

1. Drain: Minimum 3/4 inch (19 mm) NPT, with plug.
2. Air valve for pumping air into the bladder.

D. Reduced Pressure Backflow Preventers: double check w/ air gap on discharge of booster pump.

E. Water Hammer Arrestors and Air Chambers: Stainless steel casing with flexible bellow, pressurized inert gas chamber; DI WH-201 Certified; precharged for operation in the temperature range and pressure intended.

F. Traps: Self-scouring with no internal divisions; liquid seal of at least 2 inches (50 mm) but less than 4 inches (100 mm); brass or bronze with chrome-plating where exposed to view.

G. Floor Drains: Cast iron, ASME A112.6.3.
1. Strainer: Round nickel-bronze flat grating, 2 times area of connecting pipe.
2. Configuration as required to make watertight connection to waterproofing system or finish flooring, as applicable.
3. All floor drain are to be properly trapped.

2.04 HEATING AND COOLING PIPING

A. In-Line Pumps:
1. Model as indicated on drawings.
2. Working Pressure: Match or exceed the pressure of the system in which the pump is installed.
3. Casing: Cast iron.
4. Seals: Mechanical seals.
5. Connections: Threaded.
6. Motor: Voltage as indicated on drawings.
   a. Overload Protection: Built-in thermal overload protection.
7. Manufacturers:
   a. TACO or approved equal.

2.05 AIR DISTRIBUTION

A. Ductwork:
1. Material: ASTM A 653/A 653M hot dipped galvanized steel sheet, G60/Z180 coating.
2. Provide dampers at all exhaust grille locations.

B. Diffusers, Registers, and Grilles:
1. Supply Diffusers: Louvered face.
   a. Shape: As Indicated.
   b. Material: Aluminum.
   c. Color: Off-white.
2. Grilles: Perforated face.
   a. Sight-proof. (Exterior Louvers)
   b. Shape: as Indicated.
   c. Material: Aluminum.
   d. Color: Off-white.

END OF SECTION

SECTION 23 0523
GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Applications.
B. General requirements.
C. Globe valves.
D. Ball valves.
E. Butterfly valves.
F. Check valves.

1.02 ABBREVIATIONS AND ACRONYMS

A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
D. NRS: Nonrising stem.
E. PTFE: Polytetrafluoroethylene.
F. RS: Rising stem.
G. SWP: Steam working pressure.
H. TFE: Tetrafluoroethylene.
I. WOG: Water, oil, and gas.

1.03 REFERENCE STANDARDS

A. ASME B1.20.1 - Pipe Threads, General Purpose (Inch); 2013.
B. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard; 2013.
C. ASME B31.9 - Building Services Piping; 2014.
D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Qualifications; 2015.
E. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings; 2004 (Reapproved 2014).
F. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2015.
G. AWWA C606 - Grooved and Shouldered Joints; 2011.
H. MSS SP-67 - Butterfly Valves; 2011.
I. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.
J. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
C. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.
D. Maintenance Materials: Furnish Owner with one wrench for every five plug valves, in each size of square plug valve head.
    1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain valves for each valve type from single manufacturer.
   2. Company must specialize in manufacturing products specified in this section, with not less than three years of documented experience.

B. Welding Materials and Procedures: Comply with ASME BPVC-IX.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
   2. Protect valve parts exposed to piped medium against rust and corrosion.
   3. Protect valve piping connections such as grooves, weld ends, threads, and flange faces.
   4. Adjust globe, gate, and angle valves to the closed position to avoid clattering.
   5. Secure check valves in either the closed position or open position.
   6. Adjust butterfly valves to closed or partially closed position.

B. Use the following precautions during storage:
   1. Maintain valve end protection and protect flanges and specialties from dirt.
      a. Provide temporary inlet and outlet caps.
      b. Maintain caps in place until installation.
   2. Store valves in shipping containers and maintain in place until installation.
      a. Store valves indoors in dry environment.
      b. Store valves off the ground in watertight enclosures when indoor storage is not an option.

C. Exercise the following precautions for handling:
   1. Handle large valves with sling, modified to avoid damage to exposed parts.
   2. Avoid the use of operating handles or stems as rigging or lifting points.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).

B. Provide the following valves for the applications if not indicated on drawings:
   1. Throttling (Hydronic): Butterfly and Globe.
   2. Isolation (Shutoff): Butterfly and Ball.
   3. Swing Check (Pump Outlet):
      a. 2 NPS and Smaller: Bronze with bronze disc.
      b. 2-1/2 NPS and Larger: Iron with lever and weight, lever and spring, center-guided metal, or center-guided with resilient seat.

C. Substitutions of valves with higher CWP classes or SWP ratings for same valve types are permitted when specified CWP ratings or SWP classes are not available.

D. Chilled Water Valves:
   1. 2 NPS and Smaller, Bronze Valves:
      a. Threaded ends.
      b. Ball: Full port, one piece, brass trim.
      c. Swing Check: Bronze disc, Class.
      d. Globe: Bronze disc, Class 125.

E. Heating Hot Water Valves:
   1. 2 NPS and Smaller, Bronze Valves:
      a. Threaded ends.
      b. Ball: Full port, one piece, brass trim.
      c. Swing Check: Bronze disc, Class 125.
      d. Globe: Bronze disc, Class 125.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.

B. Valve Sizes: Match upstream piping unless otherwise indicated.

C. Valve Actuator Types:
   1. Gear Actuator: Quarter-turn valves 8 NPS and larger.
   2. Handwheel: Valves other than quarter-turn types.
   3. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator, of size and with chain for mounting height, as indicated in the "Valve Installation" Article.

D. Valves in Insulated Piping: Provide 2 NPS stem extensions and the following features:
   1. Gate Valves: Rising stem.
   2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
   3. Butterfly Valves: Extended neck.
   4. Memory Stops: Fully adjustable after insulation is installed.

E. Memory Stops: Fully adjustable after insulation is installed.

F. Valve-End Connections:
   1. Threaded End Valves: ASME B1.20.1.
   2. Pipe Flanges and Flanged Fittings 1/2 NPS through 24 NPS: ASME B16.5.
   3. Grooved End Connections: AWWA C606.

G. General ASME Compliance:
   1. Building Services Piping Valves: ASME B31.9.

H. Bronze Valves:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

I. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 BRONZE GLOBE VALVES

A. Class 125: CWP Rating: 200 psig:.
   1. Comply with MSS SP-80, Type 1.
   2. Body: Bronze; ASTM B62, with integral seat and screw in bonnet.
   3. Ends: Threaded or solder joint.
   4. Stem and Disc: Bronze or PTFE.
   5. Packing: Asbestos free.
      a. Handwheel: Malleable iron.

2.04 BRONZE BALL VALVES

A. One Piece, Reduced Port with Bronze Trim:
   1. Comply with MSS SP-110.
   2. CWP Rating: 400 psig.
   3. Body: Bronze.
   4. Ends: Threaded.
   5. Seats: PTFE.
   6. Stem: Bronze.
   7. Ball: Chrome plated brass.

2.05 IRON, SINGLE FLANGE BUTTERFLY VALVES

A. Lug type: Bi-directional dead end service without downstream flange.
   1. Comply with MSS SP-67, Type I.
   2. CWP Rating: 150 psig.
   3. Body Material: ASTM A126 cast iron.

4. Stem: One or two-piece stainless steel.
5. Seat: NBR.
6. Disc: Coated ductile iron.

2.06 BRONZE SWING CHECK VALVES

A. Class 125: CWP Rating: 200 psig (1380 kPa).
   1. Comply with MSS SP-80, Type 3.
   2. Body Design: Horizontal flow.
   3. Body Material: Bronze, ASTM B62.
   4. Ends: Threaded.
   5. Disc: Bronze.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges, are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

C. Provide chainwheels on operators for valves 4 NPS and larger where located 96 NPS or more above finished floor, terminating 60 NPS above finished floor.

END OF SECTION

SECTION 23 0553

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Pipe markers.

D. Ceiling tacks.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2007.

B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2013.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.

C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

D. Product Data: Provide manufacturers catalog literature for each product required.

E. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Automatic Controls: Tags. Key to control schematic.

B. Instrumentation: Tags.

C. Piping: Pipe markers.

D. Pumps: Nameplates.

E. Relays: Tags.

F. Valves: Tags and ceiling tacks where located above lay-in ceiling.

2.02 NAMEPLATES

A. Letter Color: White.

B. Letter Height: 1/4 inch.

C. Background Color: Black.

D. Plastic: Comply with ASTM D709.

2.03 TAGS

A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

B. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 PIPE MARKERS

A. Color: Comply with ASME A13.1.

B. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

D. Color code as follows:

1. Heating, Cooling, and Boiler Feedwater: Green with white letters.

2.05 CEILING TACKS

A. Description: Steel with 3/4 inch diameter color coded head.

B. Color code as follows:
   1. Heating/Cooling Valves: Blue.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

D. Use tags on piping 3/4 inch diameter and smaller.
   1. Identify service, flow direction, and pressure.
   2. Install in clear view and align with axis of piping.
   3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

E. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 23 0719
HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping insulation.

B. Flexible removable and reusable blanket insulation.

C. Jackets and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

B. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2015.

C. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2013).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than ten years of documented experience.

B. Installer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than [ten] years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, RIGID

A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
   1. K Value: ASTM C177, 0.24 at 75 degrees F.
   2. Maximum Service Temperature: 850 degrees F.
   3. Maximum Moisture Absorption: 0.2 percent by volume.

B. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.

C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

D. Vapor Barrier Lap Adhesive: Compatible with insulation.
   1. Compatible with insulation.

E. Indoor Vapor Barrier Finish:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Vinyl emulsion type acrylic, compatible with insulation, black color.

2.03 JACKETS

A. PVC Plastic.
   1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: 0 degrees F.
      b. Maximum Service Temperature: 150 degrees F.
      c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 10 mil.
      e. Connections: Brush on welding adhesive.
   2. Covering Adhesive Mastic: Compatible with insulation.
      a. Compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.

B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Exposed Piping: Locate insulation and cover seams in least visible locations.

D. Insulated Pipes Conveying Fluids Below Ambient Temperature:
   1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
   2. Insulate pump with removable vapor barrier split box housings or jackects.

E. Glass Fiber Insulated Pipes Conveying Fluids Below Ambient Temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

F. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

G. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.

H. Glass Fiber Insulated Pipes Conveying Fluids Above Ambient Temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied, or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

I. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert location: Between support shield and piping and under the finish jacket.

4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

J. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.

K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.

3.03 SCHEDULE

A. All hydronic piping to be insulated in accordance with IECC 2012 and ASHRAE 2010.

B. Insulate hot water and hot water recirculating piping with the following type and thickness of insulaton for circulating mains and runouts:

C.	Pipe Size	100-140 (deg F)	141-200 (deg F)
D.	Up to 1-1/4"	3/4"	1"
E.	1-1/2" to 2"	1"	1-1/2"
F.	2" and up	1-1/2"	2"

G. Insulate chilled cold water piping with the following type and thickness of insulation for circulating mains and runouts:

H.	Pipe Size	Cold Water
I.	Up to 1-1/4"	3/4"
J.	1-1/2" and up	1"

END OF SECTION

SECTION 23 2113
HYDRONIC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hydronic system requirements.

B. Heating water piping, above grade.

C. Chilled water piping, above grade.

D. Pipe hangers and supports.

E. Unions, flanges, mechanical couplings, and dielectric connections.

F. Valves:
   1. Globe or angle valves.
   2. Ball valves.
   3. Butterfly valves.
   4. Check valves.

1.02 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.

B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.

C. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2013.

D. ASME B31.9 - Building Services Piping; 2014.

E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

F. ASTM A106/A106M - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service; 2014.

G. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).

H. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

I. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.

J. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2013.

K. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications; 2012.

L. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011-AMD 1.

M. AWS A5.8/A5.8M - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2011 and errata.

N. AWWA C606 - Grooved and Shouldered Joints; 2011.

O. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data:
   1. Include data on pipe materials, pipe fittings, valves, and accessories.
   2. Provide manufacturers catalog information.
   3. Indicate valve data and ratings.
   4. Show grooved joint couplings, fittings, valves, and specialties on drawings and product submittals, specifically identified with the manufacturer's style or series designation.

C. Project Record Documents: Record actual locations of valves.

D. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Valve Repacking Kits: One for each type and size of valve.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

B. Provide all grooved joint couplings, fittings, valves, specialties, and grooving tools from a single manufacturer.

C. Date stamp all castings used for coupling housings, fittings, valve bodies, etc. for quality assurance and traceability.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS

A. Comply with ASME B31.9 and applicable federal, state, and local regulations.

B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
   1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
   2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
   3. Grooved mechanical joints may be used in accessible locations only.
      a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Architect (Engineer).
      b. Grooved mechanical connections and joints comply with AWWA C606.
         1) Ductile Iron: Comply with ASTM A536, Grade 65-45-12.
         2) Steel: Comply with ASTM A106/A106M, Grade B or ASTM A53/A53M.
      c. Use rigid joints unless otherwise indicated.
      d. Use gaskets of molded synthetic rubber with central cavity, pressure-responsive configuration, and complying with ASTM D2000, Grade 2CA615A15B44F17Z for circulating medium up to maximum 230 degrees F or Grade M3BA610A15B44Z for circulating medium up to maximum 200 degrees F.
   4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.

C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.

D. Valves: Provide valves where indicated:
   1. Provide drain valves where indicated, and if not indicated, provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch gate valves with cap; pipe to nearest floor drain.
   2. Isolate equipment using butterfly valves with lug end flanges or grooved mechanical couplings.
   3. For throttling, bypass, or manual flow control services, use globe, ball, or butterfly valves.

4. For throttling and isolation service in chilled and condenser water systems, use only butterfly valves.
5. In heating water or chilled water systems, butterfly valves may be used interchangeably with gate and globe valves.
6. For shut-off and to isolate parts of systems or vertical risers, use ball valves.
7. For throttling service, use plug cocks. Use non-lubricated plug cocks only when shut-off or isolating valves are also provided.

2.02 HEATING WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn, using one of the following joint types:
   1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings.
      a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
      b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.
      c. Braze: 1 BCuP copper/silver alloy.
   2. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
   3. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.22, utilizing EPDM, nontoxic synthetic rubber sealing elements.
   4. Copper is only allowed on piping 2 inches and smaller.

2.03 CHILLED WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), hard drawn; using one of the following joint types:
   1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22, solder wrought copper fittings.
      a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
      b. Braze: 1 BCuP copper/silver alloy.
   2. Grooved Joints: AWWA C606 grooved tube, fittings of same material, and copper-tube-dimension mechanical couplings.
   3. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
   4. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.22, utilizing EPDM, nontoxic synthetic rubber sealing elements.
   5. Copper in only allowed on piping 2 inches and under.

2.04 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
   3. Hangers for Cold Pipe Sizes 2 Inches and Greater: Carbon steel, adjustable, clevis.
   4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
   5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   6. Vertical Support: Steel riser clamp.
   7. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
   8. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.05 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

A. Unions for Pipe 2 Inches and Less:
   1. Ferrous Piping: 150 psig malleable iron, threaded.
   2. Copper Pipe: Bronze, soldered joints.

B. Dielectric Connections:
   1. Waterways:

a. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
b. Dry insulation barrier able to withstand 600-volt breakdown test.
c. Construct of galvanized steel with threaded end connections to match connecting piping.
d. Suitable for the required operating pressures and temperatures.

2. Flanges:
a. Dielectric flanges with same pressure ratings as standard flanges.
b. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
c. Dry insulation barrier able to withstand 600-volt breakdown test.
d. Construct of galvanized steel with threaded end connections to match connecting piping.
e. Suitable for the required operating pressures and temperatures.

2.06 GLOBE OR ANGLE VALVES

A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com.
2. Nibco, Inc: www.nibco.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Up To and Including 2 Inches:
1. Bronze body, bronze trim, union bonnet, rising stem and handwheel, inside screw with backseating stem, renewable composition disc and bronze seat, solder ends.

C. Over 2 Inches:
1. Iron body, bronze trim, bolted bonnet, rising stem, handwheel, outside screw and yoke, rotating plug-type disc with renewable seat ring and disc, flanged ends.

2.07 BALL VALVES

A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com.
2. Nibco, Inc: www.nibco.com.
3. Victaulic Company: www.victaulic.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Up To and Including 2 Inches:
1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.

C. Over 2 Inches:
1. Ductile iron body, chrome plated stainless steel ball, teflon or Virgin TFE seat and stuffing box seals, lever handle or gear operated, flanged ends, rated to 800 psi.

2.08 BUTTERFLY VALVES

A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com.
2. Nibco, Inc: www.nibco.com.
3. Victaulic Company: www.victaulic.com.

B. Body: Cast or ductile iron with resilient replaceable EPDM seat, wafer or grooved ends, extended neck.

C. Disc: Construct of aluminum bronze, chrome plated ductile iron, stainless steel, ductile iron with EPDM encapsulation, or Buna-N encapsulation.

D. Stem: Stainless steel with stem offset from the centerline to provide full 360-degree circumferential setting.

E. Operator: 10 position lever handle.

2.09 SPRING LOADED CHECK VALVES

A. Manufacturers:
   1. Conbraco Industries: www.apollovalves.com.
   2. Nibco, Inc: www.nibco.com.
   3. Victaulic Company: www.victaulic.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Iron body, bronze trim, split plate, hinged with stainless steel spring, resilient seal bonded to body, wafer, or threaded lug ends.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment using jointing system specified.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

E. After completion, fill, clean, and treat systems. Refer to Section 23 2500 for additional requirements.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install heating water, glycol, chilled water, condenser water, and engine exhaust piping to 1 requirements. Install chilled water piping to ASME B31.5 requirements.

C. Route piping in orderly manner, parallel to building structure, and maintain gradient.

D. Install piping to conserve building space and to avoid interference with use of space.

E. Group piping whenever practical at common elevations.

F. Sleeve pipe passing through partitions, walls, and floors.

G. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified.

H. Slope piping and arrange to drain at low points.

I. Inserts:
   1. Provide inserts for placement in concrete formwork.
   2. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
   3. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

J. Pipe Hangers and Supports:
   1. Provide copper plated hangers and supports for copper piping.

K. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 0719.

L. Install valves with stems upright or horizontal, not inverted.

3.03 SCHEDULES

A. Hanger Spacing for Copper Tubing.
   1. 1/2 Inch and 3/4 inch: Maximum span, 5 feet; minimum rod size, 1/4 inch.
   2. 1 Inch: Maximum span, 6 feet; minimum rod size, 1/4 inch.
   3. 1-1/2 Inches and 2 Inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.

END OF SECTION

SECTION 23 2114
HYDRONIC SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air vents.

B. Strainers.

C. Automatic flow control valves.

1.02 REFERENCE STANDARDS

A. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; 2015.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description and model.

C. Project Record Documents: Record actual locations of flow controls.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 AIR VENTS

A. Manufacturers:
   1. ITT Bell & Gossett: www.bellgossett.com/#sle.
   2. Taco, Inc: www.taco-hvac.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Manual Type: Short vertical sections of 2-inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.

C. Float Type:
   1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.

D. Maximum Fluid Pressure: 150 psi.

E. Maximum Fluid Temperature: 250 degrees F.

2.02 STRAINERS

A. Manufacturers:

1. Armstrong International, Inc: www.armstronginternational.com/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Size 2 inch and Under:
1. Screwed brass or iron body for 175 psi working pressure, Y pattern with 1/32 inch stainless steel perforated screen.

2.03 AUTOMATIC FLOW CONTROL VALVES

A. Manufacturers:
1. Hays Fluid Controls; Mesurflo Balancing Valve: www.haysfluidcontrols.com/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Construction:
1. Brass, bronze, or iron body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet with blowdown/backflush drain.
2. Built-in lug-type outlet butterfly valve with 2-position handle.

C. Calibration: Control flow within 10 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, minimum pressure 2 psi.

D. Control Mechanism: Provide stainless steel or nickel-plated, brass piston or regulator cup, operating against stainless steel helical or wave formed spring or elastomeric diaphragm and polyphenylsulfone orifice plate.

E. Size: Match system flow capacity.

F. Accessories: Provide hanging tag, inlet in-line strainer, outlet ball valve, and PT test plug extension.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install specialties in accordance with manufacturer's instructions.

B. Provide manual air vents at system high points and as indicated.

C. For automatic air vents in ceiling spaces or other concealed locations, provide vent tubing to nearest drain.

D. Install tee prior to inlet on automatic air vents. Provide pipe and manual air vent in parallel with automatic air vent.

E. Provide valved drain and hose connection on strainer blowdown connection.

F. Provide pump suction fitting on suction side of base-mounted centrifugal pumps where indicated. Remove temporary strainers after cleaning systems.

G. Provide combination pump discharge valve on discharge side of base mounted centrifugal pumps where indicated.

H. Support pump fittings with floor-mounted pipe and flange supports.

I. Provide relief valves on pressure tanks, low-pressure side of reducing valves, heat exchangers, and expansion tanks.

J. Pipe relief valve outlet to nearest floor drain.

K. Perform tests determining strength of glycol and water solution and submit written test results.

3.02 MAINTENANCE

A. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.

END OF SECTION

SECTION 23 3700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Registers/grilles:
   1. Wall-mounted, exhaust and return register/grilles.

1.02 REFERENCE STANDARDS

A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.

B. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets; 2006 (R2011).

C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Project Record Documents: Record actual locations of air outlets and inlets.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Krueger: www.krueger-hvac.com.

B. Titus: www.titus-hvac.com.

C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WALL SUPPLY REGISTERS/GRILLES

A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with one-way deflection.

B. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.

C. Fabrication: Aluminum extrusions with factory clear lacquer finish.

D. Color: white.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.03 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.

B. Frame: 1-1/4 inch margin with countersunk screw mounting.

C. Fabrication: Steel frames and blades, with factory baked enamel finish.

D. Color: As indicated on the drawings.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

END OF SECTION

SECTION 23 8126.13

SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air cooled condensing units.

B. Indoor air handling (fan and coil) units for ductless systems.

C. Controls.

1.02 REFERENCE STANDARDS

A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008, Including All Addenda.

B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.

C. ASHRAE Std 15 - Safety Standard for Refrigeration Systems and Designation and Classification of Refrigerants ; 2019.

D. ASHRAE Std 23.1 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Pressures of the Refrigerant; 2019.

E. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

G. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2015.

H. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.

C. Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.

D. Design Data: Indicate refrigerant pipe sizing.

E. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.

F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

G. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

H. Project Record Documents: Record actual locations of components and connections.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years of experience and approved by manufacturer.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier.

B. Daikin

C. Mitsubishi

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SYSTEM DESIGN

A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
   1. Heating: None.
   2. Cooling: Outdoor electric condensing unit with evaporator coils in multiple ductless indoor units ("mini-split").
   3. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.

B. Performance Requirements: See Drawings for additional requirements.
   1. Efficiency:
      a. Seasonal Energy Efficiency Ratio: 19, minimum.
      b. Comply with ASHRAE Std 90.1 I-P.

C. Electrical Characteristics:
   1. As scheduled
   2. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 26 0583.

2.03 INDOOR AIR HANDLING UNITS FOR DUCTLESS SYSTEMS

A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, evaporator coil, and controls; wired for single power connection with control transformer.

B. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
   1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
   2. Manufacturer: System manufacturer.

2.04 OUTDOOR UNITS

A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
   1. Comply with AHRI 210/240.
   2. Refrigerant: R-410A.
   3. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
   4. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23.1 and UL 207.

B. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.

C. Accessories: Filter drier, high pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
   1. Provide thermostatic expansion valves.

D. Operating Controls:
   1. Control by room thermostat to maintain room temperature setting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.

B. Verify that proper power supply is available and in correct location.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.

B. Install in accordance with NFPA 90A and NFPA 90B.

C. Install refrigeration systems in accordance with ASHRAE Std 15.

END OF SECTION

SECTION 23 8146

WATER-SOURCE UNITARY HEAT PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Console WSHP.

1.02 REFERENCE STANDARDS

A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2017, with Errata (2020).

B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks; 2016.

D. ASHRAE Std 13256-1 - Water-Source Heat Pumps - Testing and Rating for Performance - Part 1: Water-to-Air and Brine-to-Air Heat Pumps; 2021.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

F. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances; Current Edition, Including All Revisions.

G. UL 508 - Industrial Control Equipment; Current Edition, Including All Revisions.

H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

I. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide drawings indicating dimensions, rough-in connections, and electrical characteristics and connection requirements.

C. Manufacturer's Instructions: Include assembly instructions, support details, connection requirements, and start-up instructions.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.

G. Operation and Maintenance Data: Provide maintenance data, parts lists, controls, and accessories. Include trouble-shooting guide.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of the type this section with ten years of documented experience..

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 WATER-SOURCE HEAT PUMP PERFORMANCE REQUIREMENTS

A. Console Heat Pump
   1. As scheduled

2.02 GENERAL HEAT PUMP FABRICATION REQUIREMENTS

A. Energy Efficiency: ASHRAE Std 90.1 I-P EER and COP ratings, minimum.

B. ASHRAE Std 13256-1, factory-assembled unit including safety-controls, accessories, filters, piping, cables, wires, and precharged with R-410A refrigerant prior to testing.

C. Include marked terminal strip to interface field-mounted components, accessories, and thermostat.

D. Comply with UL 1995; place service and caution labels on unit.

E. Cabinet Assembly:
   1. Construct of zinc-coated, heavy-gauge, galvanized steel with exposed edges rounded.
   2. Finish: Factory apply electrostatic powder paint or baked enamel finish. Coordinate with Architect (Engineer) for specific color finish requirements of console units or other units installed within occupied spaces.
   3. Provide access panels for inspection, cleaning, and servicing of refrigerant, controls, condensate drain pan, coil, and blower.
   4. Furnish 1-inch, or 3-inch duct flange on open-discharge selections.
   5. Interior Insulation: Minimum 1/2 inch thick, dual density, bonded glass fiber.
   6. Provide flame spread of less than 25, and smoke developed classification of less than 50 in compliance with ASTM E84 and UL 723.
   7. Sound and Noise Suppression:
      a. Mechanical Rooms: 18 gauge, 0.05 inch, minimum.
      b. Occupied Spaces: 16 gauge, 0.06 inch, minimum.
      c. Compressor enclosure lined with 1/2 inch thick insulation.
      d. Include vibration isolation between compressor and heat exchanger.
      e. Include length-wise, unit base stiffeners.
      f. Foam gasket sealant around compressor and end panel perimeter.

F. Blower Section:
   1. Draw-through, forward curved fan, constructed of corrosion-resistant, galvanized material and designed for efficient, quiet operation.
   2. Factory program for both soft start and constant flow output over static pressure range.
   3. Provide preinstalled neutral wire protection when required to support specified fan type.
   4. Motor to include thermal overload protection, quick disconnect plug, and permanently lubricated bearings.
   5. Belt-Driven Motor Requirements: Provide adjustable blower motor/sheave combination device based on indicated flow performance requirements.
   6. Variable Speed Control: Configure controller to maintain adjustable flow setpoint for modulating or speed-switched units.
   7. Fan Turndown: Design control features to allow fan speed reduction to adjustable 50 percent of its capacity when the zone set point temperature is satisfied or when unit runs in fan-only mode.

G. Evaporator Section:
   1. Internally finned, aluminum or copper tubes mechanically bonded to configured aluminum plate fin, corrosion inhibitor coated as indicated.
   2. Refrigerant Coil Distributor Assembly: Orifice style with round copper distributor tubes.
   3. Thermostatic Expansion Valve: Factory select and install for wide control range.
   4. Factory leak test to minimum 450 psi and pressure test to minimum 600 psi.
   5. Tubes: Size tubes consistent with coil capacity. Fabricate suction header from rounded copper pipe.

6. Completely evacuate air and charge with proper column of refrigerant prior to shipment.
7. Drain Pan:
    a. Construct of ABS plastic, HDPE, stainless steel, or other corrosion-resistant material and flame rated in accordance with UL 94 when using polymers.
    b. Slope on two planes to pitch condensate to drain connection.
    c. Float Switch: UL 508, rated for protection against condensate overflow, controller connected.

H. Compressor Section:
1. Provide rubber mounting devices located underneath compressor mounting base.
2. Safety Interlocked Devices:
    a. Thermal overload protection.
    b. High pressure switch for protection against excessive discharge pressure.
    c. Low pressure safety for protection against loss of refrigerant charge.

I. Refrigerant Tubing Lines:
1. Tubing made of copper with service pressure ports on high- and low-pressure sides.
2. Free from contaminants and conditions such as drilling fragments, dirt, and oil.
3. Include drier, thermal expansion valve, and other related components.
4. Freeze Protection: 30 degrees F, thermistor based.
5. Insulation: Evaporator and heat exchanger sides; minimum 3/8 inch thick elastomeric insulation.

J. Refrigerant Load Control:
1. Hot-Gas Reheat Coil:
    a. Humidity Control: Upgrade thermostat to include humidity sensor tied to unit controller for integral dehumidification control.
    b. Coil Assembly: Aluminum or copper tubes mechanically expanded into evenly spaced aluminum fins.
    c. Coil Testing: Proof test at minimum of 1.5 times maximum operating pressure, then leak test at maximum operating pressure.

K. Water-to-Refrigerant Heat Exchanger:
1. Coaxial Type: Provide aluminum or copper tube and fins.
2. Brazed-Plate Type: Stainless steel, with bidirectional liquid line filter drier.
3. Insulate heat exchanger, water lines, and refrigerant suction lines for prevention of condensation at temperatures below 60 degrees F.
4. Provide rubber isolation to heat exchanging device for enhanced sound attenuation.
5. Freeze Protection: 35 degrees F by thermistor sensing.
6. Minimum Working Pressure: 400 psi water side, 600 psi DX side.
7. End Connections: Copper NPT. Provide flow shut-off ball valves.
8. Accessories:
    a. Strainer, PT test plug, and flow regulator.
    b. Unit-controlled, return-water-side solenoid valve.

L. Waterside Economizer Section:
1. Thermostat-controlled, metered, prepiped return air coil with 3-way valve assembly tied and coordinated by unit controller.
2. Provide assembly factory-installed or shipped loose for field installation as indicated.
3. Performance Requirements: As indicated on drawings.
4. Air-to-Water Hydronic Coil:
    a. Aluminum or copper tubes and aluminum plate fin combination.
    b. Accessible, cleanable, dual sloped, noncorrosive drain pan.
    c. Leak test at maximum operating pressure.
    d. Factory proof test at minimum 1.5 times maximum operating pressure.
5. Modulating or position-adjusted control valve to engage and control coil at listed EWT.

M. Filter Section:
1. ASHRAE Std 52.2, minimum efficiency reported value or MERV listing.

2. Filter Box: Provide field-installed return duct-mounted filter housing with side access.

N. Electrical:
   1. Provide factory-installed phase loss safety device for 3-phase units.
   2. Configure unit for single point connection, include terminal for field-installed components.
   3. Include separate holes and knockouts with plastic ferrules for respective electrical and controls wiring.

O. Unit Controls:
   1. DDC:
      a. Tested to monitor and handle sequencing functions and other operational modes using field-mounted thermostat and other sensors.
      b. Coordination and Sequencing:
         1) Internal Devices: Include compressors, blower, sensors, switches, valves, safeties, other components.
         2) Field-Installed Devices: Solenoid valves, thermostat, EWT sensors, LWT sensors, load-pump contact, source pump contact, and other devices required for operation.
         3) Safeties: At minimum include anti-short-cycle compressor protection, condensate overflow, refrigerant high pressure, refrigerant low pressure, loss-of-charge, refrigerant freeze protection, and freezestat.
   2. Thermostat:
      a. Field mounted and wired, tied into prewired control-interface terminals.
      b. Smart Thermostat:
         1) BAS- or BMS-linked programmable thermostat; see Section 25 1400.
      c. Programmable Thermostat:
         1) Electro-mechanical type with key- or pushbutton-operated display.
         2) Programmable occupied/unoccupied weekly and holiday schedule.
      d. Nonprogrammable Thermostat:
         1) Electro-mechanical type with key- or pushbutton-operated display.
         2) User-configurable, precoded options aligned with equipment functions.
      e. Thermostat: Single-gang-box-mounted platinum or thermistor.
         1) Local Interface to Include:
            (a) Filter maintenance indicating status.
   3. Power:
      a. Factory mounted and internally wired into nonfused electrical disconnect.
      b. Configure safety-lockout circuits to be reset either using reset switch or power cycling.
      c. 24 VAC/VDC, include minimum of 10 VA spare load capacity for potential field usage.

2.03 CONSOLE, WATER-SOURCE HEAT PUMP

A. Manufacturers:
   1. Carrier - Basis of Design.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Air Discharge Outlet: Locate on cabinet top side.

C. Compressor: Hermetically sealed, single-stage rotary type.

D. Water-to-Refrigerant Heat Exchanger: Coaxial type.

E. Blower Section: Provide 3-speed, electrically commutated motor (ECM) fan type.

F. Filter Section: Include MERV 4 rated air filter.

G. Electrical: 120 VAC, 1-phase, 60 Hz.

H. Unit Controls: Factory-supplied DDC with thermostat.
   1. BAS, SCADA, or other Integrated Automation Link: BACnet MS/TP in accordance with ASHRAE Std 135.
   2. Control Valve: Return-installed, position-adjusted, ball type; see Section 25 3519.

2.04 HOSE KITS, VALVES, FITTINGS, AND ACCESORIES

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Floor Mounted Unit(s):
   1. Support on neoprene pads with 0.125 inch minimum static deflection.

C. Source-Water:
   1. Connections to Existing Systems: Obtain approval before interrupting service; notify Architect (Engineer) in writing at least 15 calendar days prior to stat pending connections.
   2. Connect water-side piping to respective piping source loop; see Sections 23 2113 and 23 2114 for related piping and hydronic specialties.
   3. Fit-in and install externally interconnected equipment and devices components such as pumps and heat exchanger(s) as applicable to specific selections.
   4. Flush and clean piping before placing in operation; take precautions to prevent introduction of debris into piping systems.

D. Electrical: Provide equipment raceway, wiring, and cables; see Section 26 0583.

E. Coordinate installation of units with architectural, mechanical, and electrical work.

F. On water coils, provide shut-off valve on supply line and balancing valve on return line. Provide manual air vents at high points complete with stop valve.

G. Install wall-mounted thermostats, humidistats, and switch controls in electrical outlet boxes at heights to match lighting controls. Provide thermal break barrier for outdoor walls.

3.02 CONNECTIONS

A. Connect supply/return piping from heat pump to appropriate water source piping; see Section 23 2113. Complete end connections with unions and shut-off valves; see Section 23 2114.

B. Connect condensate drain pan to indirect waste connection with P-trap of adequate depth to seal against fan pressure; see Section 22 1005.

C. Install cleanouts at each directional change in piping.

D. Field Install all electrical devices provided by the heat pump manufacturer not specified to be factory-installed.

3.03 SYSTEM STARTUP

A. Provide manufacturer's field representative to perform systems startup; see Section 23 0593.

B. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.

C. Adjust for proper operation within manufacturer's published tolerances.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Inspect for and remove blocks, shipping bolts, and tie-down straps.

C. Test the heat pumps for performance compliance upon completion of the installation and energization of all electrical circuitry.

D. Operational Test: Start units to confirm unit operation and motor rotation.

E. Controls and Safety Switches: Test, adjust, and replace damaged/malfunctioning controls and equipment.

F. Coordinate BAS, BMS, or Integrated Automation linking between unit controller(s) and remote front-end interface; see Section 25 1500.

G. Malfunctioning Units: Remove, replace, and retest as specified above as directed by the Engineer.

H. Test unit for rated flow.

3.05 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals for closeout submittals.

B. See Section 01 7900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to the designated representative of the Owner.

D. Demonstration: Demonstrate operation of system to Owner personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.

E. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Manufacturer's training personnel.
   4. Location: At project site.

END OF SECTION

SECTION 26 0001

BASIC ELECTRICAL MATERIALS AND METHODS

GENERAL REQUIREMENTS

1.01 CONFORM TO THE CURRENT REQUIRMENTS OF THE NEC - 2017

1.02 PERFORM ALL WORK UNDER THIS SECTION IN ACCORDANCE WITH APPLICABLE CODES & STANDARDS AND BEST INDUSTRY AND TRADE PRACTICES.

1.03 COORDINATE ALL WITH OTHER TRADES PRIOR TO BIDDING. THIS IS A RENOVATION PROJECT.

1.04 BY SUBMISSION OF A BID, THE CONTRACTOR REPRESENTS THAT THEY HAVE THOROUGHLY REVIEWED THE DOCUMENTS, THESE SPECIFICATIONS, AND THE PROJECT SITE IN SUFFICIENT DETAIL AND THAT THE BID REPRESENTS THE WORK NECESSARY FOR A FULLY OPERATIONAL SYSTEM. THE BID SUBMISSION ALSO REPRESENTS THAT THE CONTRACT HAS BEEN AFFORDED REASONABLE OPPORTUNITY TO ASK QUESTIONS AND RECEIVED ANSWERS IN WRITING; SHARED WITH ALL BIDDERS.

1.05 SUSPECT MATERIAL: SHOULD THE CONTRACTOR ENCOUNTER SUSPECTED ACM MATERIAL, THEY ARE TO STOP WORK IN THE AFFECTED AREA AND NOTIFY THE OWNER AND ENGINEER. THE OWNER WILL ARRANGE FOR TESTING IF THE EXISTING ACM DOCUMENTATION IS UNCLEAR. REMEDIATION OF ACM IS NOT INCLUDED IN THIS PROJECT SCOPE BY THE CONTRACTOR.

1.06 THE APPROVED SCHEDULE WILL NOT BE MODIFIED EXCEPT BY APPROVAL OF THE ENGINEER. WITH EACH PAY APPLICATION, THE SCHEDULE WILL BE HAND MARKED TO INDICATE PROGRESS DEVIATIONS FROM THE SCHEDULE. THE DEVIATIONS WILL BE REVIEWED BY THE ENGINEER AND OWNER AND THE CONTRACTOR WILL DEVELOP A PLAN TO REUTRN TO THE SCHEDULED WORK FLOW AT NO ADDITIONAL COST TO THE PROJECT. BY SUBMITTING A BID, CONTRACTOR ACKNOWLEDGES UNDERSTANDING OF GENERAL AND SUPPLEMENTAL CONDITIONS OF THIS PROJECT AS IT PERTAINS TO FAILURE TO PERFORM.

MATERIALS & METHODS

2.01 WIRING METHODS

A. **Conductors And Cables:**

1. Insulated Single Conductors (600 Volts And Below):
   a. Temperature Rating: 75 deg C.
   b. Stranded Conductor Branch Circuits: Larger than 10 AWG: copper, 600 volt, THHN insulation.
   c. Solid Conductor Branch Circuits 10 AWG and smaller: copper, 600 volt, THHN insulation.
   d. Control Circuit Conductors: Copper, stranded, 300 volt, THHN insulation.
2. Insulated Multiple Conductor Cable:
   a. Jacketed:
      1) Unshielded.
3. Terminating Devices:
   a. Cable lugs.
   b. Cable connectors.
   c. Splices and terminals:
      1) Spring wire for sizes #10 and smaller.
4. Accessories:
   a. Cable grips.
   b. Conductor harness.
   c. Wire pulling lubricant.
   d. Electrical insulating tape.

e. Conductor identifying markers.

B. Raceways And Boxes:
1. Conduit And Electrical Tubing:
a. Electrical Metallic Tubing (EMT) And Fittings:
1) EMT: Thin wall ferrous steel tubing, hot dipped, galvanized, smooth interior reamed ends.
2) Fittings and Conduit Bodies: Steel set-screw.
b. Plastic Conduit and Fittings:
1) Conduit: Schedule 40 PVC.
2) Fittings And Conduit Bodies: PVC.
c. Conduit Supports, Clamps, and Straps: Steel.
d. Enclosures And Cabinets: Steel.
2. Junction Boxes: Rated for application, galvanized steel with conduit knockouts and threaded holes for mounting wiring devices. Conform to requirements of NEMA 250.
a. Minimum Sizes:
1) Octagonal: 4 inch (102 mm) wide by 1.5 inch (38 mm) deep.
2) Square: 4 inch (102 mm) square by 1.5 inch (38 mm) deep.
3) Dry Locations: Galvanized sheet steel, NEMA 1, welded seams and cover held by stainless steel fasteners.
4) Damp or Wet Locations: Cast malleable iron with corrosion finish, NEMA 3R, threaded conduit entries, neoprene coverplate gasket, and coverplate held by stainless steel fasteners.
3. Outlet Boxes: Rated for application, galvanized steel with conduit knockouts and threaded holes for mounting wiring devices. Conform to requirements of NEMA 250.
a. Minimum Sizes:
1) Single Device: 3 inch (76 mm) high by 2 inch (51 mm) wide by 2 inch (51 mm) deep.
2) Gang Device: 3 inch (76 mm) high by 2 inch (51 mm) wide (per gang) by 2 inch (51 mm) deep.
3) Dry Locations: Galvanized sheet steel, NEMA 1, welded seams and cover held by stainless steel fasteners.
4) Damp or Wet Locations: Cast malleable iron with corrosion finish, NEMA 3R, threaded conduit entries, neoprene coverplate gasket, and coverplate held by stainless steel fasteners.
4. Pull Boxes: Comply with requirements of NEMA 250.
a. Dry Locations: Galvanized sheet steel, NEMA 1, welded seams and cover held by stainless steel fasteners.
b. Damp or Wet Locations: Cast malleable iron with corrosion finish, NEMA 3R, threaded conduit entries, neoprene coverplate gasket, and coverplate held by stainless steel fasteners.
5. Masonry Boxes: Galvanized steel with conduit knockouts and threaded holes for mounting devices. Designed and rated for mounting in masonry walls.
6. Mechanical System Requirements: Provide boxes, disconnects, starters, wiring, devices, etc as required by all mechanical systems. Verify requirements prior to bidding.
7. Conduit application schedule:
a. Electrical Metallic Tubing (EMT): Concealed interior locations and Mechanical Areas.
b. Flexible Metal Conduit: Connections between accessible junction boxes and lighting fixtures, in dry locations and Equipment connections.

2.02 WIRING DEVICES:

A. Receptacles:
1. Duplex Receptacles:
a. Rating: 20 Amp, 125V, 3 wire duplex grounding type with Nylon face, feed-through feature and prewired leads.
b. Color: by Architect.

2. Ground Fault Circuit Interrupting (GFCI) Receptacles:
    a. Rating: 15 Amp, 125V, 3 wire duplex grounding type with Nylon face, feed-through feature and pre-wired leads.
    b. Color: by Architect.
3. All receptacles in dwelling areas or childcare areas to be tamper resistant.

B. Wall Switches:
1. Type: Single pole.
2. Rating: 20 Amp, 125 volt AC, totally enclosed toggle switch with grounding lug.
3. Color: by Architect.

C. Wall Plates:
1. Material: Stainless steel with matching metallic mounting screws and raised shoulder design in mechanical and electrical rooms. Nylon coverplates in other areas. Color by Architect/Owner.
2. Weatherproof Coverplate: Spring loaded, die-cast aluminum with configuration to match outlet type. Conform to code requirements for protection with plug installed.

D. Remote Control Switching Devices:
1. Types: Occupancy Sensors.
2. Technologies: Passive Infrared.
3. Ratings: 120 volt, 600 watt.
4. Type: Single pole switching devices.
5. Color: White.

2.03 LOW-VOLTAGE DISTRIBUTION

A. Enclosed Switches: Steel dead front enclosure.

B. Enclosed Circuit Breakers: Steel deadfront enclosure.

2.04 LIGHTING

A. Interior Luminaires: As indicated on drawings.

END OF SECTION

SECTION 26 0505

SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

PART 3 EXECUTION

2.01 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned facilities.

B. Demolition drawings are based on casual field observation and existing record documents.

C. Report discrepancies to Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

2.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 14 days before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Notify Owner before partially or completely disabling system.
   2. Notify local fire service.
   3. Make notifications at least 14 days in advance.
   4. Make temporary connections to maintain service in areas adjacent to work area.

2.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

E. Repair adjacent construction and finishes damaged during demolition and extension work.

F. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

2.04 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment that remain or that are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

C. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

END OF SECTION

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Electrical tape.

D. Heat shrink tubing.

E. Oxide inhibiting compound.

F. Wire pulling lubricant.

1.02 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.

F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2013.

G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

H. NEMA WC 70 - Nonshielded Power Cable 2000 V or Less for the Distribution of Electrical Energy; 2009.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

K. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

L. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

M. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

N. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
3. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

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

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Metal-clad cable is not permitted.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.

H. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

I. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
         2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
         3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
   2. Control Circuits: 14 AWG.

J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

K. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
      a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
   3. Color Code:

a. 480Y/277 V, 3 Phase, 4 Wire System:
   1) Phase A: Brown.
   2) Phase B: Orange.
   3) Phase C: Yellow.
   4) Neutral/Grounded: Gray.
b. 208Y/120 V, 3 Phase, 4 Wire System:
   1) Phase A: Black.
   2) Phase B: Red.
   3) Phase C: Blue.
   4) Neutral/Grounded: White.
c. Equipment Ground, All Systems: Green.
d. Travelers for 3-Way and 4-Way Switching: Purple.
e. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
f. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.
   2. Control Circuits: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
      a. Installed Underground: Type THHN/THWN or THHN/THWN-2.

2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 0526.

C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use compression connectors.

D. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
   3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
   4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
   5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
   6. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

H. Mechanical Connectors: Provide bolted type or set-screw type.

I. Compression Connectors: Provide circumferential type or hex type crimp configuration.

J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.05 ACCESSORIES

A. Electrical Tape:
   1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
   2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
   3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
   4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
   5. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. Include circuit lengths required to install connected devices within 10 ft of location indicated.

5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
    a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
    b. Increase size of conductors as required to account for ampacity derating.
    c. Size raceways, boxes, etc. to accommodate conductors.
8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

G. Install conductors with a minimum of 12 inches of slack at each outlet.

H. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.

I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

K. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
   1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
      a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
   2. Damp Locations: Use insulating covers specifically designed for the connectors or heat shrink tubing.
      a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
   3. Wet Locations: Use heat shrink tubing.

M. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

C. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

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

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

1. Do not use conductors smaller that #6 AWG for grounding electrode system.

D. Bonding and Equipment Grounding:

1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 26 0553.

END OF SECTION

SECTION 26 0529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2013.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.

1.05 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with applicable building code.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Comply with the following. Where requirements differ, comply with most stringent.
      a. NFPA 70.
      b. Requirements of authorities having jurisdiction.

2. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
3. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 1.5. Include consideration for vibration, equipment operation, and shock loads where applicable.
5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
6. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
7. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    a. Indoor Dry Locations: Use zinc-plated steel unless otherwise indicated.
    b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel or stainless steel unless otherwise indicated.
    c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
    d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
2. Conduit Clamps: Bolted type unless otherwise indicated.
3. Manufacturers:
    a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
    b. Erico International Corporation: www.erico.com/#sle.
    c. Thomas & Betts Corporation: www.tnb.com/#sle.
    d. Substitutions: See Section 01 6000 - Product Requirements.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
1. Manufacturers:
    a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
    b. Erico International Corporation: www.erico.com/#sle.
    c. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
    d. Substitutions: See Section 01 6000 - Product Requirements.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
1. Comply with MFMA-4.
2. Channel Material:
    a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
    b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
3. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch.
4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
5. Manufacturers:
    a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
    b. Thomas & Betts Corporation: www.tnb.com/#sle.
    c. Unistrut, a brand of Atkore International Inc: www.unistrut.com/#sle.
    d. Substitutions: See Section 01 6000 - Product Requirements.
    e. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
      c. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch diameter.
      d. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      e. Outlet Boxes: 1/4 inch diameter.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
   3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
   4. Hollow Masonry: Use toggle bolts.
   5. Hollow Stud Walls: Use toggle bolts.
   6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   7. Powder-actuated fasteners are not permitted.
   8. Hammer-driven anchors and fasteners are not permitted.
   9. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
      a. Comply with MFMA-4.
      b. Channel Material: Use galvanized steel.
      c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.
   10. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
   11. Manufacturers - Mechanical Anchors:
      a. Hilti, Inc: www.us.hilti.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.

D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

E. Unless specifically indicated or approved by Architect (Engineer), do not provide support from suspended ceiling support system or ceiling grid.

F. Unless specifically indicated or approved by Architect (Engineer), do not provide support from roof deck.

G. Do not penetrate or otherwise notch or cut structural members without approval of Engineer.

H. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.

3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

I. Conduit Support and Attachment: Also comply with Section 26 0533.13.

J. Box Support and Attachment: Also comply with Section 26 0533.16.

K. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

L. Secure fasteners according to manufacturer's recommended torque settings.

M. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect support and attachment components for damage and defects.

C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Flexible metal conduit (FMC).

C. Liquidtight flexible metal conduit (LFMC).

D. Electrical metallic tubing (EMT).

E. Conduit fittings.

F. Accessories.

1.02 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.

B. ANSI C80.3 - American National Standard for Steel Electrical Metallic Tubing (EMT); 2005.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.

E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2012.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

H. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

I. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

J. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

K. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
   4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
   5. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for fittings.

C. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2 inch (53 mm) trade size and larger.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).

C. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
   1. EMT conduit is permitted only in damp locations if compression fittings are used.

D. Exposed, Interior, Not Subject to Physical Damage: Use electrical metallic tubing (EMT).

E. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed below 8 feet, except within electrical and communication rooms or closets.
      b. Where exposed below 20 feet in warehouse areas.

F. Exposed, Exterior: Use galvanized steel rigid metal conduit.

G. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
   1. Maximum Length: 6 feet.

H. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.

I. Fished in Existing Walls, Where Necessary: Use flexible metal conduit or MC cable.

2.02 CONDUIT REQUIREMENTS

A. Fittings for Grounding and Bonding: Also comply with Section 26 0526.

B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Branch Circuits: 3/4 inch (21 mm) trade size.
   2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
   3. Control Circuits: 1/2 inch (16 mm) trade size.
   4. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.
   5. Underground, Interior: 1 inch (27 mm) trade size.
   6. Underground, Exterior: 1 inch (27 mm) trade size.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:

1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.

2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.

2.06 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use compression (gland) or set-screw type.
   a. Do not use indenter type connectors and couplings.
4. Damp or Wet Locations (where permitted): Use fittings listed for use in wet locations.

2.07 ACCESSORIES

A. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

B. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.

C. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive conduits.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is diagrammatic.

2. When conduit destination is indicated without specific routing, determine exact routing required.
3. Conceal all conduits unless specifically indicated to be exposed.
4. Conduits in the following areas may be exposed, unless otherwise indicated:
   a. Electrical rooms.
   b. Mechanical equipment rooms.
   c. Within joists in areas with no ceiling.
5. Unless otherwise approved, do not route conduits exposed:
   a. Across floors.
   b. Across roofs.
   c. Across top of parapet walls.
   d. Across building exterior surfaces.
6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
7. Arrange conduit to maintain adequate headroom, clearances, and access.
8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
9. Arrange conduit to provide no more than 150 feet between pull points.
10. Route conduits above water and drain piping where possible.
11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
12. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    a. Heaters.
    b. Hot water piping.
    c. Flues.
13. Group parallel conduits in the same area together on a common rack.

E. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
   a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use of wire for support of conduits is not permitted.
9. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

F. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.

5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

G. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

H. Underground Installation:
1. Minimum Cover, Unless Otherwise Indicated or Required:
   a. Underground, Exterior: 24 inches.
   b. Under Slab on Grade: 12 inches to bottom of slab.
2. Provide underground warning tape in accordance with Section 26 0553 along entire conduit length.

I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where conduits are subject to earth movement by settlement or frost.

J. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
   a. Where conduits enter building from outside.
   b. Where service conduits enter building from underground distribution system.
   c. Where conduits enter building from underground.
   d. Where conduits may transport moisture to contact live parts.
2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
   a. Where conduits pass from outdoors into conditioned interior spaces.
   b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

K. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
   1. Where conduits pass from outdoors into conditioned interior spaces.
   2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

L. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

M. Provide grounding and bonding in accordance with Section 26 0526.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Correct deficiencies and replace damaged or defective conduits.

3.04 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2012.

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
   4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
   5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
   6. Coordinate the work with other trades to preserve insulation integrity.
   7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
   8. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   3. Use suitable concrete type boxes where flush-mounted in concrete.
   4. Use suitable masonry type boxes where flush-mounted in masonry walls.
   5. Use raised covers suitable for the type of wall construction and device configuration where required.
   6. Use shallow boxes where required by the type of wall construction.
   7. Do not use "through-wall" boxes designed for access from both sides of wall.
   8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
   9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
   10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
   11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
   12. Wall Plates: Comply with Section 26 2726.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
   1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA 250 Environment Type, Unless Otherwise Indicated:
   3. Junction and Pull Boxes Larger Than 100 cubic inches:
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

E. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

F. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

G. Box Locations:
   1. Locate boxes to be accessible. Whereaccess panels are required, locate and configure upon approval by Engineer.
   2. Unless dimensioned, box locations indicated are approximate.
   3. Locate boxes as required for devices installed under other sections or by others.
      a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
   4. Locate boxes so that wall plates do not span different building finishes.
   5. Locate boxes so that wall plates do not cross masonry joints.
   6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
   8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
   9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
      a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
      b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area.
   10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
   11. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
      a. Concealed above accessible suspended ceilings.
      b. Within joists in areas with no ceiling.
      c. Electrical rooms.
      d. Mechanical equipment rooms.

H. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
   3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.

I. Install boxes plumb and level.

J. Flush-Mounted Boxes:
   1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
   2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.

3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

K. Install boxes as required to preserve insulation integrity.

L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

N. Close unused box openings.

O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

P. Provide grounding and bonding in accordance with Section 26 0526.

Q. Identify boxes in accordance with Section 26 0553.

3.03 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 0553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Warning signs and labels.

1.02 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.

B. Sequencing:
   1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
   2. Do not install identification products until final surface finishes and painting are complete.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for identification labels, underground warning tape, and warning signs and labels.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.06 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
      a. Panelboards:
         1) Identify ampere rating.
         2) Identify voltage and phase.
         3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

b. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify power source and circuit number. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.

2. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
3. Use identification label or handwritten text using indelible marker on inside of door at each motor controller to identify nameplate horsepower, full load amperes, code letter, service factor, voltage, and phase of motor(s) controlled.
4. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".
5. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
a. Service equipment.
b. Industrial control panels.
c. Motor control centers.
d. Elevator control panels.
e. Industrial machinery.
6. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
a. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
7. Use warning labels, identification nameplates, or identification labels to identify electrical hazards for equipment where multiple power sources are present with the word message "DANGER; Hazardous voltage; Multiple power sources may be present; Disconnect all electric power including remote disconnects before servicing" or approved equivalent.

B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
a. Within boxes when more than one circuit is present.
b. Within equipment enclosures when conductors and cables enter or leave the enclosure.
4. Use underground warning tape to identify direct buried cables.

C. Identification for Raceways:
1. Use color-coded bands to identify systems other than normal power system for accessible conduits at maximum intervals of 20 feet.

a. Color-Coded Bands: Use vinyl color coding electrical tape to mark bands 3 inches wide.
1) Color Code:
(a) Emergency Power System: Orange.
(b) Fire Alarm System: Red.
2) Vinyl Color Coding Electrical Tape: Comply with Section 26 0519.
2. Use underground warning tape to identify underground raceways.

D. Identification for Boxes:
1. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
a. For exposed boxes in public areas, use only identification labels.

E. Identification for Devices:
1. Use identification label to identify fire alarm system devices.
a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below device location.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
1. Materials:
a. Indoor Clean, Dry Locations: Use plastic nameplates.
b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
a. Use only for indoor locations.
2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
1. Minimum Size: 1 inch by 2.5 inches.
2. Legend:
a. System designation where applicable:
1) Emergency Power System: Identify with text "EMERGENCY".
2) Fire Alarm System: Identify with text "FIRE ALARM".
b. Equipment designation or other approved description.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
a. System Designation: 1 inch.
b. Equipment Designation: 1/2 inch.
5. Color:
a. Normal Power System: White text on black background.
b. Emergency Power System: White text on orange background.
c. Fire Alarm System: White text on red background.

D. Format for Caution and Warning Messages:

1. Minimum Size: 2 inches by 4 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/2 inch.
5. Color: Black text on yellow background unless otherwise indicated.

2.03 WIRE AND CABLE MARKERS

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

C. Legend: Power source and circuit number or other designation indicated.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

E. Minimum Text Height: 1/8 inch.

F. Color: Black text on white background unless otherwise indicated.

2.04 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
1. Materials:
2. Minimum Size: 7 by 10 inches unless otherwise indicated.

C. Warning Labels:
1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   a. Do not use labels designed to be completed using handwritten text.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

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

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
1. Surface-Mounted Equipment: Enclosure front.
2. Flush-Mounted Equipment: Inside of equipment door.
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Branch Devices: Adjacent to device.
6. Interior Components: Legible from the point of access.
7. Conduits: Legible from the floor.
8. Boxes: Outside face of cover.
9. Conductors and Cables: Legible from the point of access.
10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Mark all handwritten text, where permitted, to be neat and legible.

END OF SECTION

SECTION 26 0573
POWER SYSTEM STUDIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protective device coordination study.

B. Criteria for the selection and adjustment of equipment and associated protective devices not specified in this section, as determined by studies to be performed.

1.02 REFERENCE STANDARDS

A. IEEE 242 - IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems; 2001, with Errata (2003).

B. IEEE 399 - IEEE Recommended Practice for Industrial and Commercial Power Systems Analysis; 1997.

C. NEMA MG 1 - Motors and Generators; 2014.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 70E - Standard for Electrical Safety in the Workplace; 2015.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work to provide equipment and associated protective devices complying with criteria for selection and adjustment, as determined by studies to be performed.
   2. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Submit study reports prior to or concurrent with product submittals.
   2. Do not order equipment until matching study reports and product submittals have both been evaluated by Architect (Engineer).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Study reports, stamped or sealed and signed by study preparer.

C. Product Data: In addition to submittal requirements specified in other sections, include manufacturer's standard catalog pages and data sheets for equipment and protective devices indicating information relevant to studies.
   1. Include characteristic time-current trip curves for protective devices.
   2. Identify modifications made in accordance with studies that:
      a. Can be made at no additional cost to Owner.
      b. As submitted will involve a change to the contract sum.

D. Field quality control reports.

E. Certification that field adjustable protective devices have been set in accordance with requirements of studies.

1.05 POWER SYSTEM STUDIES

A. Scope of Studies:
   1. Scope of study is the upstream feeder breakers (normal and emergency) and panels serving more than one elevator, including branch breaker to each elevator. Coordinate and set the breakers to minimize the impact of a downstream fault on the other elevators.
   2. Except where study descriptions below indicate exclusions, analyze system at each bus from primary protective devices of utility source down to each piece of equipment involved,

including parts of system affecting calculations being performed (e.g. fault current contribution from motors).

3. Include in analysis alternate sources and operating modes (including known future configurations) to determine worst case conditions.

B. General Study Requirements:
   1. Comply with NFPA 70.
   2. Perform studies utilizing computer software complying with specified requirements; manual calculations are not permitted.

C. Data Collection:
   1. Compile information on project-specific characteristics of actual installed equipment, protective devices, feeders, etc. as necessary to develop single-line diagram of electrical distribution system and associated input data for use in system modeling.
      a. Utility Source Data: Include primary voltage, maximum and minimum three-phase and line-to-ground fault currents, impedance, X/R ratio, and primary protective device information.
         1) Obtain up-to-date information from Utility Company.
      b. Generators: Include manufacturer/model, kW and voltage ratings, and impedance.
      c. Motors: Include manufacturer/model, type (e.g. induction, synchronous), horsepower rating, voltage rating, full load amps, and locked rotor current or NEMA MG 1 code letter designation.
      d. Transformers: Include primary and secondary voltage ratings, kVA rating, winding configuration, percent impedance, and X/R ratio.
      e. Protective Devices:
         1) Circuit Breakers: Include manufacturer/model, type (e.g. thermal magnetic, electronic trip), frame size, trip rating, voltage rating, interrupting rating, available field-adjustable trip response settings, and features (e.g. zone selective interlocking).
         2) Fuses: Include manufacturer/model, type/class (e.g. Class J), size/rating, and speed (e.g. time delay, fast acting).
      f. Protective Relays: Include manufacturer/model, type, settings, current/potential transformer ratio, and associated protective device.
      g. Conductors: Include feeder size, material (e.g. copper, aluminum), insulation type, voltage rating, number per phase, raceway type, and actual length.

D. Protective Device Coordination Study:
   1. Comply with applicable portions of IEEE 242 and IEEE 399.
   2. Analyze alternate scenarios considering known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
   3. Analyze protective devices and associated settings for suitable margins between time-current curves to provide adequate protection for equipment and conductors while achieving full selective coordination.

E. Study Reports:
   1. General Requirements:
      a. Identify date of study and study preparer.
      b. Identify study methodology and software product(s) used.
      c. Identify scope of studies, assumptions made, implications of possible alternate scenarios, and any exclusions from studies.
      d. Identify base used for per unit values.
      e. Include single-line diagram and associated input data used for studies; identify buses on single-line diagram as referenced in reports, and indicate bus voltage.
      f. Include conclusions and recommendations.
   2. Protective Device Coordination Study:
      a. For each scenario, include time-current coordination curves plotted on log-log scale graphs.
      b. For each graph include (where applicable):

1) Partial single-line diagram identifying the portion of the system illustrated.
2) Protective Devices: Time-current curves with applicable tolerance bands for each protective device in series back to the source, plotted up to the maximum available fault current at the associated bus.
3) Conductors: Damage curves.
4) Transformers: Inrush points and damage curves.
5) Generators: Full load current, overload curves, decrement curves, and short circuit withstand points.
6) Motors: Full load current, starting curves, and damage curves.
7) Capacitors: Full load current and damage curves.

c. For each protective device, identify fixed and adjustable characteristics with available ranges and recommended settings.
1) Circuit Breakers: Include long time pickup and delay, short time pickup and delay, and instantaneous pickup.
2) Include ground fault pickup and delay.
3) Include fuse ratings.
4) Protective Relays: Include current/potential transformer ratios, tap, time dial, and instantaneous pickup.

d. Identify cases where either full selective coordination or adequate protection is not achieved, along with recommendations.

1.06 QUALITY ASSURANCE

A. Study Preparer Qualifications: Professional electrical engineer licensed in West Virginia and with minimum ten years experience in preparation of studies of similar type and complexity using specified computer software.
1. Study preparer may be employed by manufacturer of electrical distribution equipment.
2. Study preparer may be employed by field testing agency.

B. Field Testing Agency Qualifications: Independent testing organization specializing in testing, analysis, and maintenance of electrical systems with minimum five years experience; NETA Accredited Company.

C. Computer Software for Study Preparation: Use the latest edition of commercially available software utilizing specified methodologies.

PART 3 EXECUTION

2.01 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Adjust equipment and protective devices for compliance with studies and recommended settings.

D. Notify Architect (Engineer) of any conflicts with or deviations from studies. Obtain direction before proceeding.

E. Submit detailed reports indicating inspection and testing results, and final adjusted settings.

2.02 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

END OF SECTION

SECTION 26 0583
WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment.

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
   2. Determine connection locations and requirements.

B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 MATERIALS

A. Wiring Devices: As specified in Section 26 2726.

B. Flexible Conduit: As specified in Section 26 0533.13.

C. Wire and Cable: As specified in Section 26 0519.

D. Boxes: As specified in Section 26 0533.16.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 2416
PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overcurrent protective devices for panelboards.

1.02 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e (Amended 2017).

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

E. NEMA PB 1 - Panelboards; 2011.

F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; 2013.

G. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 67 - Panelboards; Current Edition, Including All Revisions.

L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

M. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

N. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

O. UL 1053 - Ground-Fault Sensing and Relaying Equipment; Current Edition, Including All Revisions.

P. UL 1699 - Arc-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   4. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.

C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of panelboards and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
   3. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
   4. Include documentation of listed series ratings.

D. Source Quality Control Test Reports: Include reports for tests designated in NEMA PB 1 as routine tests.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.

G. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Panelboard Keys: Two of each different key.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Eaton Corporation: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

D. Substitutions: See Section 01 6000 - Product Requirements.

E. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 PANELBOARDS - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature:
      a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

C. Short Circuit Current Rating:
   1. Listed series ratings are acceptable, except where not permitted by motor contribution according to NFPA 70.
   2. Label equipment utilizing series ratings as required by NFPA 70.

D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.

E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.

F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.

G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
   1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   3. Provide separate isolated/insulated ground bus _____.

H. Conductor Terminations: Suitable for use with the conductors to be installed.

I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.
   2. Boxes: Galvanized steel unless otherwise indicated.
      a. Provide wiring gutters sized to accommodate the conductors to be installed.
   3. Fronts:
      a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
      b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
      c. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
   4. Lockable Doors: All locks keyed alike unless otherwise indicated.

J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

K. Surge Protective Devices: Factory-installed, internally mounted surge protective devices are provided in accordance with Section 26 4300, list and label panelboards as a complete assembly including surge protective device.

L. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
   1. Where electronic circuit breakers equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.
   2. Where accessory ground fault sensing and relaying equipment is used, equip companion overcurrent protective devices with ground-fault shunt trips.
      a. Use zero sequence ground fault detection method unless otherwise indicated.
      b. Provide test panel and field-adjustable ground fault pick-up and delay settings.

M. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.

N. Multi-Section Panelboards: Provide enclosures of the same height, with feed-through lugs or sub-feed lugs and feeders as indicated or as required to interconnect sections.

O. Load centers are not acceptable.

P. Provide the following features and accessories where indicated or where required to complete installation:
   1. Feed-through lugs.
   2. Sub-feed lugs.

2.03 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
   1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
   2. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
         1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
         2) 14,000 rms symmetrical amperes at 480 VAC.
      b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
      c. Series Rated Systems: Provide circuit breakers listed in combination with upstream devices to provide interrupting rating not less than the short circuit current rating indicated.
   3. Conductor Terminations:
      a. Provide mechanical lugs unless otherwise indicated.
      b. Lug Material: Copper, suitable for terminating copper conductors only.
   4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
   6. Provide the following circuit breaker types where indicated:
      a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
      b. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
      c. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Combination type listed as complying with UL 1699.
      d. 100 Percent Rated Circuit Breakers: Listed for application within the panelboard where installed at 100 percent of the continuous current rating.
   7. Do not use tandem circuit breakers.
   8. Do not use handle ties in lieu of multi-pole circuit breakers.
   9. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.
   10. Provide the following features and accessories where indicated or where required to complete installation:
      a. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
      b. Handle Pad-Lock Provision: For locking circuit breaker handle in OFF position.

2.04 SOURCE QUALITY CONTROL

A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive panelboards.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

E. Provide required support and attachment in accordance with Section 26 0529.

F. Install panelboards plumb.

G. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.

H. Provide grounding and bonding in accordance with Section 26 0526.
   1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
   2. Terminate branch circuit isolated grounding conductors on isolated/insulated ground bus only. Do not terminate on solidly bonded equipment ground bus.

I. Install all field-installed branch devices, components, and accessories.

J. Multi-Wire Branch Circuits: Group grounded and ungrounded conductors together in the panelboard as required by NFPA 70.

K. Set field-adjustable circuit breaker tripping function settings as indicated.

L. Set field-adjustable ground fault protection pickup and time delay settings as indicated.

M. Provide filler plates to cover unused spaces in panelboards.

N. Provide GFCI and AFCI circuit breakers where indicated, or where required by the National Electric Code.

O. Identify panelboards in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Perform inspection, testing, and adjusting in accordance with Section 01 4000.

C. Inspect and test in accordance with NETA ATS, except Section 4.

D. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers and circuit breakers larger than 400 amperes. Tests listed as optional are not required.

E. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.

F. Test GFCI circuit breakers to verify proper operation.

G. Test AFCI circuit breakers to verify proper operation.

H. Test shunt trips to verify proper operation.

I. Procure services of a qualified manufacturer's representative to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's reports with field quality control submittals.

J. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

3.05 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 2726
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Wall plates.

1.02 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (R 2010).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2012.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

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

B. Sequencing:
   1. Do not install wiring devices until final surface finishes and painting are complete.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

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

C. Operation and Maintenance Data:
   1. GFCI Receptacles: Include information on status indicators.

D. Project Record Documents: Record actual installed locations of wiring devices.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

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

C. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hubbell Incorporated: www.hubbell-wiring.com.

B. Leviton Manufacturing Company, Inc: www.leviton.com.

C. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us

D. Substitutions: See Section 01 6000 - Product Requirements.

E. Source Limitations: Where possible, provide products for each type of wiring device produced by a single manufacturer and obtained from a single supplier.

2.02 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

D. Provide GFCI protection for receptacles installed within 6 feet of sinks.

E. Provide GFCI protection for receptacles installed in elevator shafts and machine rooms.
   1. Exception: Receptacles serving sump pumps are to be non-GFCI. Sump pump receptacles are to be placed on dedicated circuits separate from other devices and fixtures located in the elevator shaft or machine room.

F. Unless noted otherwise, do not use combination switch/receptacle devices.

2.03 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.

B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.

C. Wiring Devices Installed in Finished Spaces: White with white nylon wall plate.

D. Wiring Devices Installed in Unfinished Spaces: Gray with galvanized steel wall plate.

E. Wiring Devices Installed in Wet or Damp Locations: White with specified weatherproof cover.

2.04 WALL SWITCHES

A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.05 RECEPTACLES

A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
   2. NEMA configurations specified are according to NEMA WD 6.

B. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
    a. Provide test and reset buttons of same color as device.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

2.06 WALL PLATES

A. Wall Plates: Comply with UL 514D.
    1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
    2. Size: Standard.
    3. Screws: Metal with slotted heads finished to match wall plate finish.

B. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

C. Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.

D. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

E. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
    1. Mounting Heights: Unless otherwise indicated, as follows:
        a. Wall Switches: 48 inches above finished floor.
        b. Receptacles: 18 inches above finished floor or 6 inches above counter.
    2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
    3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.

4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect (Engineer) to obtain direction prior to proceeding with work.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

J. Install wall switches with OFF position down.

K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Perform field inspection, testing, and adjusting in accordance with Section 01 4000.

C. Inspect each wiring device for damage and defects.

D. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

E. Test each receptacle to verify operation and proper polarity.

F. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

G. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING

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

END OF SECTION

SECTION 26 2813

FUSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fuses.

1.02 REFERENCE STANDARDS

A. NEMA FU 1 - Low Voltage Cartridge Fuses; 2012.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.

D. UL 248-12 - Low-Voltage Fuses - Part 12: Class R Fuses; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.
      a. Fusible Enclosed Switches: See Section 26 2816.16.
   2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.
   3. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Fuses: One set(s) of three for each type and size installed.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Bussmann, a division of Eaton Corporation: www.cooperindustries.com.

B. Mersen (formerly Ferraz Shawmut): ferrazshawmut.mersen.com.

C. Littelfuse, Inc: www.littelfuse.com.

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 APPLICATIONS

A. General Purpose Branch Circuits: Class RK1, time-delay.

B. Individual Motor Branch Circuits: Class RK1, time-delay.

2.03 FUSES

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.

C. Provide fuses of the same type, rating, and manufacturer within the same switch.

D. Comply with UL 248-1.

E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.

F. Voltage Rating: Suitable for circuit voltage.

G. Class R Fuses: Comply with UL 248-12.

H. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Do not install fuses until circuits are ready to be energized.

B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION

SECTION 26 2816.13
ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Enclosed circuit breakers.

1.02 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e (Amended 2017).

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

H. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted enclosed circuit breakers where indicated.
   4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of circuit breaker.

C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed circuit breakers and adjacent equipment with all required clearances indicated.

D. Field Quality Control Test Reports.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

F. Project Record Documents: Record actual installed locations of enclosed circuit breakers.

G. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed circuit breaker internal components, enclosure, and finish.

1.07 FIELD CONDITIONS

A. Maintain ambient temperature between 23 degrees F and 104 degrees F during and after installation of enclosed circuit breakers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB/GE; _____: www.geindustrial.com/#sle.

B. Eaton Corporation; _____: www.eaton.com/#sle.

C. Schneider Electric; Square D Products; _____: www.schneider-electric.us/#sle.

D. Substitutions: See Section 01 6000 - Product Requirements.

E. Source Limitations: Furnish enclosed circuit breakers and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 ENCLOSED CIRCUIT BREAKERS

A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between 23 degrees F and 104 degrees F.

D. Short Circuit Current Rating:
   1. Provide enclosed circuit breakers with listed short circuit current rating not less than the available fault current at the installed location indicated on the drawings.

E. Conductor Terminations: Suitable for use with the conductors to be installed.

F. Provide thermal magnetic circuit breakers unless otherwise indicated.

G. Provide insulated, groundable fully rated solid neutral assembly, with a suitable lug for terminating each neutral conductor.

H. Provide solidly bonded equipment ground bus in each enclosed circuit breaker, with a suitable lug for terminating each equipment grounding conductor.

I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
   2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.

3. Provide surface-mounted enclosures unless otherwise indicated.

J. Provide externally operable handle with means for locking in the OFF position.

2.03 MOLDED CASE CIRCUIT BREAKERS

A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

B. Interrupting Capacity:
   1. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      a. 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
   2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.

C. Conductor Terminations:
   1. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.

E. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

F. Provide the following features and accessories where indicated or where required to complete installation:
   1. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
   2. Auxiliary Switch: DPDT switch suitable for connection to system indicated for indicating when circuit breaker has tripped or been turned off.
   3. Alarm Switch: SPDT switch suitable for connection to system indicated for indicating when circuit breaker has tripped.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings of the enclosed circuit breakers are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive enclosed circuit breakers.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 26 0529.

E. Install enclosed circuit breakers plumb.

F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 26 0526.

H. Identify enclosed circuit breakers in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Test shunt trips to verify proper operation.

C. Correct deficiencies and replace damaged or defective enclosed circuit breakers.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from circuit breaker enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 2816.16
ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Enclosed safety switches.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

H. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   4. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.

C. Project Record Documents: Record actual locations of enclosed switches.

D. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

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

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Eaton Corporation: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

D. Substitutions: See Section 01 6000 - Product Requirements.

E. Source Limitations: Furnish enclosed switches and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between -22 degrees F and 104 degrees F.

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Short Circuit Current Rating:
   1. Minimum Ratings:
      a. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.

G. Enclosed Safety Switches Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.

H. Provide with switch blade contact position that is visible when the cover is open.

I. Fuse Clips for Fusible Switches: As required to accept fuses indicated.

J. Conductor Terminations: Suitable for use with the conductors to be installed.

K. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.

L. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

M. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.
   2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.

N. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

O. Heavy Duty Switches:
   1. Comply with NEMA KS 1.
   2. Conductor Terminations:
      a. Provide mechanical lugs unless otherwise indicated.

b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

2.03 ELEVATOR SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
1. Altitude: Less than 6,600 feet.
2. Ambient Temperature: Between -22 degrees F and 104 degrees F.

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Short Circuit Current Rating:
1. Minimum Ratings:
a. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.

G. Provide with switch blade contact position that is visible when the cover is open.

H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.

I. Conductor Terminations: Suitable for use with the conductors to be installed.

J. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.

K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

L. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
a. Indoor Clean, Dry Locations: Type 1.
b. Outdoor Locations: Type 3R.
2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.

M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

N. Heavy Duty Switches:
1. Comply with NEMA KS 1.
2. Conductor Terminations:
a. Provide mechanical lugs unless otherwise indicated.
b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

O. Accessories:
1. Shunt Trippable Mechanism
2. Fire alarm Interface: Ability to receive input from fire alarm system to control shunt trip feature of safety switch per fire code requirement.
3. Fire Alarm Voltage Monitoring Relay.
4. Auxillary Contacts.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive enclosed safety switches.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 26 0529.

E. Install enclosed switches plumb.

F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 26 0526.

H. Provide fuses complying with Section 26 2813 for fusible switches as indicated or as required by equipment manufacturer's recommendations.

I. Identify enclosed switches in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Perform field inspection, testing, and adjusting in accordance with Section 01 4000.

C. Inspect and test in accordance with NETA ATS, except Section 4.

D. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.

E. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 3600
TRANSFER SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Transfer switches for low-voltage (600 V and less) applications and associated accessories:
   1. Automatic transfer switches.
   2. Includes bypass/isolation transfer switches.
   3. Remote annunciators.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.

B. Section 26 0526 - Grounding and Bonding for Electrical Systems.

C. Section 26 0529 - Hangers and Supports for Electrical Systems.

D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

C. NEMA ICS 10 Part 1 - Industrial Control and Systems Part 1: Electromechanical AC Transfer Switch Equipment; 2020.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 110 - Standard for Emergency and Standby Power Systems; 2019.

G. UL 1008 - Transfer Switch Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate compatibility of transfer switches to be installed with work provided under other sections or by others.
   2. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.
   3. Coordinate arrangement of equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   4. Coordinate the work with placement of supports, anchors, etc. required for mounting.
   5. Notify Architect (Engineer) of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Where work of this section involves interruption of existing electrical service, arrange service interruption with Owner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product, including ratings, configurations, dimensions, finishes, weights, service condition requirements, and installed features.
   1. Where applicable, include characteristic trip curves for overcurrent protective devices upon request.

C. Shop Drawings: Include dimensioned plan views and sections indicating locations of system components, required clearances, and field connection locations. Include system interconnection schematic diagrams showing all factory and field connections.
   1. Clearly indicate whether proposed short circuit current ratings are based on testing with specific overcurrent protective devices or time durations; indicate short-time ratings where applicable.

D. Specimen Warranty: Submit sample of manufacturer's warranty.

E. Evidence of qualifications for installer.

F. Evidence of qualifications for maintenance contractor (if different entity from installer).

G. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.

H. Manufacturer's certification that products meet or exceed specified requirements.

I. Source quality control test reports.

J. Manufacturer’s detailed field testing procedures.

K. Field quality control test reports.

L. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
   1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.

M. Executed Warranty: Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.

N. Project Record Documents: Record actual locations of system components, installed circuiting arrangements and routing, and final equipment settings.

1.06 QUALITY ASSURANCE

A. Comply with the following:
   1. NFPA 70 (National Electrical Code).
   2. NFPA 110 (Standard for Emergency and Standby Power Systems); meet requirements for Level 2 system.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
   1. Authorized service facilities located within 100 miles of project site.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years documented experience with power transfer systems of similar size, type, and complexity; manufacturer's authorized installer.

E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store transfer switches in accordance with manufacturer's instructions.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's instructions to avoid damage to transfer switch components, enclosure, and finish.

1.08 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide minimum one year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Transfer Switches:
   1. ASCO Power Technologies; _____: www.ascopower.com/#sle.
   2. Eaton Corporation: www.eaton.com/#sle.
   3. Cummins.

B. Substitutions: See Section 01 6000 - Product Requirements.

C. Source Limitations: Furnish transfer switches and accessories produced by a single manufacturer and obtained from a single supplier.

2.02 TRANSFER SWITCHES

A. Provide complete power transfer system consisting of all required equipment, conduit, boxes, wiring, supports, accessories, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Applications:
   1. Utilize open transition transfer unless otherwise indicated or required.
   2. For transfer of highly inductive loads (e.g. large motors and transformers), utilize delayed transition transfer.
   3. Provide signal before transfer contacts for transfer switches serving elevators.

D. Construction Type: Only "contactor type" (open contact) transfer switches are acceptable. Do not use "breaker type" (enclosed contact) transfer switches.

E. Automatic Transfer Switch:
   1. Transfer Switch Type: Bypass/isolation automatic transfer switch.
   2. Voltage: As indicated on the drawings.
   3. Ampere Rating: As indicated on the drawings.
   4. Load Served: Elevators.
   5. Primary Source: Utility.
   6. Alternate Source: Enginer Generator.
   7. Features:
      a. Controls to integrate to existing generator. Auxiliary switches to integrate with elevator controllers..

F. Comply with NEMA ICS 10 Part 1, and list and label as complying with UL 1008 for the classification of the intended application (e.g. emergency, optional standby).

G. Do not use double throw safety switches or other equipment not specifically designed for power transfer applications and listed as transfer switch equipment.

H. Load Classification: Classified for total system load (any combination of motor, electric discharge lamp, resistive, and tungsten lamp loads with tungsten lamp loads not exceeding 30 percent of the continuous current rating) unless otherwise indicated or required.

I. Switching Methods:
   1. Open Transition:

a. Provide break-before-make transfer without a neutral position that is not connected to either source, and with interlocks to prevent simultaneous connection of the load to both sources.
b. Where in-phase transfer is indicated, utilize in-phase monitor to initiate transfer when phase angle difference between sources is near zero to limit in-rush currents.

2. Delayed Transition:
a. Provide break-before-make transfer with programmable time delay in a neutral position not connected to either source, and with interlocks to prevent simultaneous connection of the load to both sources.

3. Obtain control power for transfer operation from line side of source to which the load is to be transferred.

J. Service Conditions: Provide transfer switches suitable for continuous operation at indicated ratings under the service conditions at the installed location.

K. Enclosures:
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
a. Indoor Clean, Dry Locations: Type 1 or Type 12.

2. Finish: Manufacturer's standard unless otherwise indicated.

L. Short Circuit Current Rating:

M. Automatic Transfer Switches:
1. Description: Transfer switches with automatically initiated transfer between sources; electrically operated and mechanically held.
2. Control Functions:
a. Automatic mode.
b. Test Mode: Simulates failure of primary/normal source.
c. Voltage and Frequency Sensing:
1) Undervoltage sensing for each phase of primary/normal source; adjustable dropout/pickup settings.
2) Undervoltage sensing for alternate/emergency source; adjustable dropout/pickup settings.
3) Underfrequency sensing for alternate/emergency source; adjustable dropout/pickup settings.
d. Outputs:
1) Contacts for engine start/shutdown (except where direct generator communication interface is provided).
2) Auxiliary contacts; one set(s) for each switch position.
e. Adjustable Time Delays:
1) Engine generator start time delay; delays engine start signal to override momentary primary/normal source failures.
2) Transfer to alternate/emergency source time delay.
3) Retransfer to primary/normal source time delay.
4) Engine generator cooldown time delay; delays engine shutdown following retransfer to primary/normal source to permit generator to run unloaded for cooldown period.
f. In-Phase Monitor (Open Transition Transfer Switches): Monitors phase angle difference between sources for initiating in-phase transfer.
g. Engine Exerciser: Provides programmable scheduled exercising of engine generator selectable with or without transfer to load; provides memory retention during power outage.
3. Status Indications:
a. Connected to alternate/emergency source.
b. Connected to primary/normal source.
c. Alternate/emergency source available.
4. Automatic Sequence of Operations:

a. Upon failure of primary/normal source for a programmable time period (engine generator start time delay), initiate starting of engine generator where applicable.
b. When alternate/emergency source is available, transfer load to alternate/emergency source after programmable time delay.
c. When primary/normal source has been restored, retransfer to primary/normal source after a programmable time delay. Bypass time delay if alternate/emergency source fails and primary/normal source is available.
d. Where applicable, initiate shutdown of engine generator after programmable engine cooldown time delay.

N. Bypass/Isolation Transfer Switches:
1. Description: Factory-assembled units consisting of interconnected transfer switch and bypass/isolation switch that permits manual bypass and isolation of the transfer switch with connection of the load to either source.
2. Bypass/Isolation Switch Type: Provide overlapping (make-before-break) switches with no interruption of power to load. Load break (break-before-make) switches that interrupt power to load are not acceptable.
3. Bypass/Isolation Operation:
a. Operable from exterior of enclosure.
b. Normal Mode: Provides for normal operation of transfer switch.
c. Test Mode: Provides for operational testing of bypassed transfer switch without affecting power to load.
d. Isolate Mode: Provides for complete isolation of transfer switch from all power sources, permitting removal from unit.

O. Remote Annunciators:
1. Remote Annunciator Mounting: Wall-mounted; Provide flush-mounted annunciator for finished areas and surface-mounted annunciator for non-finished areas unless otherwise indicated. Mount one each at generator and in building Fire command Center. Clearly label as "Elevator Automatic Transfer Switch - Elevator Machine Room"
2. Transfer Switch Status Indications:
a. Connected to alternate/emergency source.
b. Connected to primary/normal source.
c. Alternate/emergency source available.

P. Interface with Other Work:
1. Interface with Existing Work: Existing generator and elevator controllers..

2.03 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Perform production tests on transfer switches at factory to verify operation and performance characteristics prior to shipment. Include certified test report with submittals.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings and configurations of transfer switches are consistent with the indicated requirements.

C. Verify that rough-ins for field connections are in the proper locations.

D. Verify that mounting surfaces are ready to receive transfer switches.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Arrange equipment to provide minimum clearances and required maintenance access.

D. Provide required support and attachment in accordance with Section 26 0529.

E. Install transfer switches plumb and level.

F. Unless otherwise indicated, mount floor-mounted transfer switches on properly sized 3 inch high concrete pad constructed in accordance with Section 03 3000.

G. Provide grounding and bonding in accordance with Section 26 0526.

H. Identify transfer switches and associated system wiring in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Provide services of a manufacturer's authorized representative to prepare and start systems and perform inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.

C. Prepare and start system in accordance with manufacturer's instructions.

D. Automatic Transfer Switches:
   1. Inspect and test in accordance with NETA ATS, except Section 4.
   2. Perform inspections and tests listed in NETA ATS, Section 7.22.3. The insulation-resistance tests listed as optional are not required.

E. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

F. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.04 CLEANING

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

3.05 CLOSEOUT ACTIVITIES

A. Training: Train Owner's personnel on operation, adjustment, and maintenance of transfer switches.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of four hours of training.
   3. Instructor: Manufacturer's authorized representative.

END OF SECTION

SECTION 26 5100
INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires.

B. Exit signs.

C. Ballasts and drivers.

D. Accessories.

1.02 REFERENCE STANDARDS

A. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).

B. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).

C. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.

D. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; Illuminating Engineering Society; 2008.

E. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; Illuminating Engineering Society; 2015.

F. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2006.

G. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.

H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. NFPA 101 - Life Safety Code; 2015.

K. UL 844 - Luminaires for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.

L. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

M. UL 1598 - Luminaires; Current Edition, Including All Revisions.

N. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Architect (Engineer) of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
   2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.

C. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Lenses and Louvers: Two percent of total quantity installed for each type, but not less than one of each type.

E. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

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

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide three year manufacturer warranty for LED luminaires, including drivers.

C. Provide five year pro-rata warranty for batteries for emergency lighting units.

D. Provide ten year pro-rata warranty for batteries for self-powered exit signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS - LUMINAIRES

A. As scheduled..

B. Substitutions: See Section 01 6000 - Product Requirements, except where individual luminaire types are designated with substitutions not permitted.

2.02 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 01 6000 - Product Requirements, except where individual luminaire types are designated with substitutions not permitted.

2.03 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:
   1. Ceiling Compatibility: Comply with NEMA LE 4.
   2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
   3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.

H. Hazardous (Classified) Location Luminaires: Listed and labeled as complying with UL 844 for the classification of the installed location.

I. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

J. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

2.04 EXIT SIGNS

A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
   1. Number of Faces: Single- or double-face as indicated or as required for installed location.
   2. Directional Arrows: As indicated or as required for installed location.

B. Self-Powered Exit Signs:
   1. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   2. Battery: Sealed maintenance-free nickel cadmium unless otherwise indicated.
   3. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   4. Provide low-voltage disconnect to prevent battery damage from deep discharge.
   5. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.

2.05 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

B. Dimmable LED Drivers:
   1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
   2. Control Compatibility: Fully compatible with the dimming controls to be installed.
      a. Wall Dimmers: See Section 26 2726.

2.06 ACCESSORIES

A. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.

B. Install products in accordance with manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

D. Provide required support and attachment in accordance with Section 26 0529.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Suspended Ceiling Mounted Luminaires:
   1. Do not use ceiling tiles to bear weight of luminaires.
   2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
   3. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.
   4. Secure pendant-mounted luminaires to building structure.
   5. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
   6. In addition to ceiling support wires, provide two galvanized steel safety wire(s), minimum 12 gage, connected from opposing corners of each recessed luminaire to building structure.
   7. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:
   1. Install trims tight to mounting surface with no visible light leakage.
   2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
   3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.

H. Suspended Luminaires:
   1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
   2. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet nominal length, with no more than 4 feet between supports.
   3. Unless otherwise indicated, support pendants from swivel hangers.

I. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

J. Install accessories furnished with each luminaire.

K. Bond products and metal accessories to branch circuit equipment grounding conductor.

L. Emergency Lighting Units:

M. Exit Signs:
   1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

N. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.

E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect (Engineer).

3.05 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect (Engineer). Secure locking fittings in place.

B. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect (Engineer) or authority having jurisdiction.

3.06 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of luminaires to Architect (Engineer), and correct deficiencies or make adjustments as directed.

3.08 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 28 4600

FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire alarm system design and installation, including all components, wiring, and conduit.

B. Circuits from protected premises to supervising station, including conduit.

C. Replacement and removal of existing fire alarm system components, wiring, and conduit indicated.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Cor 1, 2012).

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. NFPA 72 - National Fire Alarm and Signaling Code; 2016.

F. NFPA 101 - Life Safety Code; 2015.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Evidence of designer qualifications.

C. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
   1. Copy (if any) of list of data required by authority having jurisdiction.
   2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
   3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
   4. System zone boundaries and interfaces to fire safety systems.
   5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
   6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
   7. List of all devices on each signaling line circuit, with spare capacity indicated.
   8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
   9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
   10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
   11. Certification by the manufacturer of the control unit that the system design complies with Contract Documents.
   12. Certification by Contractor that the system design complies with Contract Documents.
   13. Do not show existing components to be removed.

D. Evidence of installer qualifications.

E. Inspection and Test Reports:
   1. Submit inspection and test plan prior to closeout demonstration.
   2. Submit documentation of satisfactory inspections and tests.

3. Submit NFPA 72 "Inspection and Test Form," filled out.

F. Operating and Maintenance Data: See Section 01 7800 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
   1. Original copy of NFPA 72 with portions that are not relevant to this project neatly crossed out by hand; label with project name and date.
   2. Complete set of specified design documents, as approved by authority having jurisdiction.
   3. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
   4. Contact information for firm that will be providing contract maintenance and trouble call-back service.
   5. List of recommended spare parts, tools, and instruments for testing.
   6. Replacement parts list with current prices, and source of supply.
   7. Detailed troubleshooting guide and large scale input/output matrix.
   8. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
   9. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.

G. Project Record Documents: See Section 01 7800 for additional requirements; have one set available during closeout demonstration:
   1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
   2. "As installed" wiring and schematic diagrams, with final terminal identifications.
   3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.

H. Closeout Documents:
   1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
   2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
   3. Certificate of Occupancy.

I. Maintenance Materials, Tools, and Software: Furnish the following for Owner's use in maintenance of project.
   1. Furnish spare parts of same manufacturer and model as those installed; deliver in original packaging, labeled in same manner as in operating and maintenance data and place in spare parts cabinet.

1.04 QUALITY ASSURANCE

A. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.

B. Installer Qualifications: Firm with minimum 10 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
   1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
   2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
   3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
   4. Certified in West Virginia as fire alarm installer.

1.05 WARRANTY

A. Provide control panel manufacturer's warranty that system components other than wire and conduit are free from defects and will remain so for 1 year after date of Substantial Completion.

B. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Alarm Control Units and Accessories:
   1. Edwards System Technology (EST).
   2. Provide control units, made by the same manufacturer as the existing system, as required to extend and integrate the new elevator systems into the existing Edwards FA system, for a fully code compliant elevator fire alarm system.

B. Initiating Devices and Notification Appliances:
   1. Edwards System Technology.
   2. Same manufacturer as control units.
   3. Provide initiating devices and notification appliances made by the same manufacturer, where possible.

C. Substitutions: See Section 01 6000 - Product Requirements.
   1. Manufacturer substitutions are not permitted as this is a modification of a newer existing system.

2.02 FIRE ALARM SYSTEM

A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:
   1. Provide all components necessary, regardless of whether shown in Contract Documents or not.
   2. Protected Premises: Project area including machine rooms, hoistways, and elevator lobbies..
   3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
      a. ADA Standards.
      b. The requirements of the State Fire Marshal.
      c. The requirements of the local authority having jurisdiction .
      d. Applicable local codes.
      e. Contract Documents (drawings and specifications).
      f. NFPA 101.
      g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
   4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination of zones, in addition to general evacuation of entire premises.
   5. Voice Notification: Provide emergency voice/alarm communications with multichannel capability; digital.
   6. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.
   7. Program notification zones and voice messages as directed by Owner.
   8. Combined Systems: Do not combine fire alarm system with other non-fire systems.

B. Supervising Stations and Fire Department Connections:
   1. Public Fire Department Notification: By on-premises supervising station.

C. Circuits:
   1. Initiating Device Circuits (IDC): Class B, Style A.

2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
3. Notification Appliance Circuits (NAC): Class B, Style W.

D. Power Sources:
1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.
4. Each Computer System: Provide uninterruptible power supply (UPS).

2.03 EXISTING COMPONENTS

A. Clearly label components that are "Not In Service."

B. Remove unused existing components and materials from site and dispose of properly.

2.04 FIRE SAFETY SYSTEMS INTERFACES

A. Supervision: Provide supervisory signals in accordance with NFPA 72 for the following:
1. Sprinkler water control valves.
2. Elevator shut-down control circuits.

B. Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:
1. Sprinkler water flow.
2. Elevator lobby, elevator hoistway, and elevator machine room smoke detectors.

C. Elevators:
1. Elevator lobby, hoistway, and machine room smoke detectors: Elevator recall for fire fighters' service.
2. Elevator Machine Room Heat Detector: Shut down elevator power prior to hoistway sprinkler activation.
3. Sprinkler pressure or waterflow: Shut down elevator power prior to hoistway sprinkler activation.

2.05 COMPONENTS

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

B. Fire Alarm Control Units: Analog, addressable type; listed, classified, and labeled as suitable for the purpose intended.

C. Master Control Unit: As specified for Basis of Design above, or equivalent.

D. Initiating Devices:
1. Addressable Systems:
a. Addressable Devices: Individually identifiable by addressable fire alarm control unit.
b. Provide suitable addressable interface modules as indicated or as required for connection to conventional (non-addressable) devices and other components that provide a dry closure output.
2. Manual Pull Stations: EST Signature Series.
a. Provide 1 extra.
3. Smoke Detectors: EST Signature Series.
a. Provide 1 extra.
4. Heat Detectors: EST Signature Series.
a. Provide 1 extra.
5. Addressable Interface Devices: EST Signature Series.
a. Provide 1 extra.

E. Notification Appliances:
1. Speakers/Strobes: EST Signature Series.
a. Provide 1 extra.

2. Strobes: EST Signature Series.
    a. Provide 1 extra.

F. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.

G. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.

H. Locks and Keys: Deliver keys to Owner.

I. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
    1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
    2. Provide one for each control unit where operations are to be performed.
    3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
    4. Provide extra copy with operation and maintenance data submittal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and Contract Documents.

B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.

C. Obtain Owner's approval of locations of devices, before installation.

D. Install instruction cards and labels.

3.02 INSPECTION AND TESTING FOR COMPLETION

A. Notify Owner 7 days prior to beginning completion inspections and tests.

B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.

C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.

E. Provide all tools, software, and supplies required to accomplish inspection and testing.

F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.

G. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
    1. Record all system operations and malfunctions.
    2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
    3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
    4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 CLOSEOUT

A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
    1. Be prepared to conduct any of the required tests.
    2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
    3. Have authorized technical representative of control unit manufacturer present during demonstration.

4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
5. Repeat demonstration until successful.

B. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
1. Specified diagnostic period without malfunction has been completed.
2. Approved operating and maintenance data has been delivered.
3. Spare parts, extra materials, and tools have been delivered.
4. All aspects of operation have been demonstrated to Owner.
5. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.
6. Occupancy permit has been granted.
7. Specified pre-closeout instruction is complete.

END OF SECTION