

ADDENDUM #1

Project: Maintenance and Repairs to Building S-219
Camp McCain Training Site
Grenada, MS
PN: 28160202

Professional: Beard + Riser Architects PLLC

Date Issued: July 27, 2016

Pages: 74 pages(including this page)



This addendum form is part of the Construction Documents, modifying and superseding where it is inconsistent with them. All other conditions of the Contract Documents remain unchanged. Acknowledge receipt of this addendum by inserting its number in the appropriate place on the bid proposal form:

1. **Addition:** Prebid Conference Meeting Minutes.
2. **Clarification:** Clarification regarding existing penetrations in roof - All the existing penetrations will remain except the existing boiler flue in the Southeast corner of the building, which is called out to be demolished with the boiler. The only two new (additional) roof penetrations are the intake hoods for outside air. The bathroom exhaust fan is being replaced and will go back in the same location with a new curb with the new roof. All the plumbing vent stacks will remain in place.
3. **Clarification:** Painting - Existing hollow metal doors and frames are to be stripped down to original paint coat, sanded to provide a smooth consistent finish and repainted.
4. **Clarification:** Work by Owner - Camp McCain will remove all furniture and equipment such as projectors and screens for storage during the course of this work. Equipment will be reinstalled by Camp McCain.
5. **Revision:** Existing HVAC Registers - There are 8 existing wall registers located in Meeting 21. Four of these registers are being reused for new mechanical systems and four are being decommissioned. Provide CMU infill to match the adjacent walls at 4 decommissioned registers. CMU is to be fingered in to match adjacent pattern. Prepare and paint.
6. **Clarification:** Exposed Conduits - All new and existing exposed conduits and wire moldings are to be painted to match adjacent wall.
7. **Clarification:** Door Number Signage - All door number signs are to be removed for painting. Camp McCain will provide new signs to be installed by the GC.
8. **Deletion:** Remove all fixed louvers as indicated on exterior elevations A2.0 by note R2.
9. **Revision/Addition:** The attached sixty (60) page Addendum #1 from Atherton Engineers.

END OF ADDENDUM #1



MEETING MINUTES

7.20.16 *Pre-Bid Conference*

Project: Maintenance and Repairs to Building S-219
Camp McCain Training Center
Grenada, Mississippi

Location: S-219

Time: 10:00 a.m.

Attendees: refer to attached attending list

Attachments: Attending List, Pre-Bid Conference Agenda

-
- Reviewed bidding requirements: Desiree Hilton reviewed bidding requirements as outlined on the attached agenda.
 - Bid date
 - Up until 1:30PM August 9, 2016. No bids will be accepted once doors close at 1:30 pm.
 - Bids will be received by the Adjutant General, State of MS, in the office of the Adjutant General; 1410 Riverside Drive, Jackson, MS.
 - Follow the "Bidding Requirements" section in project manual exactly.
 - No written additions or deducts are allowed on bid envelope.
 - Review the specifications thoroughly as the upfront requirements have changed.
 - 215 calendar days to complete the work.
 - 100% Performance (Form 25) and Payment Bonds (Form 25A) are required.
 - Liquidated Damages for the project are \$861.11 per day.
 - Alternate bids – There is one deductive alternate bid to omit the new LED lighting and reinstall the existing fluorescent fixtures.
 - Addenda
 - Questions or clarifications will only be answered in writing via email or fax to the Professional by close of business on Tuesday July 26, with Mrs. Hilton's review being completed by July 29.

- It is critical that contractors become familiar with the building prior to submitting bids. Contact Mr. Thomas Sellers for building access between now and bid date.
- ISSUES RAISED AT MEETING TO BE ADDRESSED VIA ADDENDUM:
 - If Alternate #1 is taken and the existing fluorescent fixtures are reinstalled are they to be re-lamped and what if ballasts need to be replaced?
 - Are the roofing panels 16" or 24" widths?
 - Who is responsible for removing and reinstalling furniture and equipment including projectors and screens?
 - If the wall grills in the large meeting room are being removed how are the openings filled?
 - Verify that the roof curbs specified meet the manufacturer's warranty requirements.
 - Are the existing door frames to be prepped and painted or completely stripped and refinished?
 - Are exposed conduits and wire mold to be painted on the interior?
 - The door signage is in poor condition. If removed for painting who will supply the new door signs?

END OF MINUTES

Minutes prepared by: John Beard, AIA

ATTENDANCE ROSTER
PRE-BID CONFERENCE

PROJECT: Maintenance & Repairs to Bldg S-219, Camp McCain

LOCATION: Grenada, MS

TIME/DATE: 10:00 AM - July 20, 2016

(Print) NAME	FIRM REPRESENTED EMAIL ADDRESS	PHONE NUMBER OR CELL
Desiree Hilton	military Dept - Contracting cynthia.d.hilton2.nfg@mail.mil	601-313-6246
MIKE CAIN	EDMONDS ENGINEERING	601-609-0391
PHIL TIDWELL	TIDWELL ELECTRIC	662-563-2992
Paul Parker	Parker Builders & Bell's H. out	662-571-0340
Car Willmer	Willmer Paint, sudden link willmerengilic.com	662-335-2869
Brian Hunt	bhunt@hunting.com	662-417-6221
Don Sellers	thomas.L.sellers8.nfg@mail.mil	601-260-7277
LEE JACKSON	lee.w.jackson4.nfg@mail.mil	662 294 0902
Joey Whitfield	S/W Electrical	662-299-2114
JASON MCKNIGHT	MCKnight & Son	662 289 6923
JOHN BEARD	BEARD + PISER ARMYCOTS	662-897-5618

PRE-BID CONFERENCE
For

Maintenance And Repairs to Building S-219 Camp McCain Training Center
Grenada, MS

1. If you haven't signed in please do so at this time.
2. Introductions: Contract Officer: Desiree Hilton
PM: Leon Sellers
A&E: Beard and Riser, Architects
Military Personnel _____
3. a. Make sure you read specifications as they have been updated. If clarification is needed, it will be covered by written addendum. Such clarification will only be in form of a response to a written request and received not less than six (6) working days prior to the bid opening. No clarification will be offered as a response to a telephone request. The A&E and Project Manager are my technical support. They can give you guidance and clarification on any technical matter.

b. Amendments shall be distributed in a reasonable time for consideration of prospective bidders in preparing their bids. By law, no addendum will be issued within 2 working days (48 working hours) of the time established for receipt of bids. Failure to do so may result in delay of bid opening. (See ITB Section 00 20 00 - 4/7)
4. Cover the following:
 - a. **Bid opening 1:30 p.m., August 9, 2016** in classroom 192B at Joint Forces Headquarters in Jackson, MS. Don't be late getting to the bid room we cannot except bids once door is closed at 1:30 P.M. Bring Driver Licenses for identification purposes. Bidder submitting bid, whether hand delivered or mailed, is responsible for ensuring that the sealed bid is delivered by the required time and the bidder assumes all risk of delivery. Bidder hand delivering his/her bid is encouraged to arrive 1 hour early to preclude any delays due to heightened security at our facility. Bidder mailing his /her bid must insure that the mailing envelope is marked same as described in the Direction Mailing Bids-DMB Section 00 21 13 -1/1. Bidder may modify the bid PRIOR to the scheduled closing time indicated in the Advertisement of Bids on the outside of the sealed envelope containing the bid. A facsimile will not be acceptable.
 - b. **Cover Bid Form, Envelope, Bid Security etc....**
Bid Forms (found on ITB Section 00 20 00 - 1/7) and Bid Security (found on ITB Section 00 20 00 - 1/7)

Make sure that they are properly filled out and signed.

All
addendums
should be
turned in to
Beard &
Riser no
later than

Beard &
Riser
should turn
in
addendums
to CO for
approval no
later than

Envelope (sample found pg DMB Section 00 21 13 - 1/1)
Make sure you properly mark the envelopes

Certificate of Responsibility Number (ITB Section 00 20 00 - 4/7-5/7)
Make sure your number is up to date and on outside of envelope as shown on Sample

c. **COVER FED CLAUSES** Although this is a State Contract hence it has Federal Funds tied to it therefore Federal Clauses such as the Buy American Act apply (found on pg GC Section 00 70 00 - 29/33).

The Davis-Bacon **Wage Rate does not apply**. The Davis-Bacon **Overtime does apply**. (anything over 40 hrs a week is time and a half)
(NO CERTIFIED PAYROLL REQUIRED FOR THE MILITARY DEPT)

d. No Asbestos material used in construction. (found on pg GC Section 00 70 00 - 15/33, Hazardous Waste Materials)

e. Out of State Bidders – read pg ITB Section 00 20 00 - 5/7 for Non Resident Contractors

f. C&D (Construction & Debris) Report found on pg GC Section 00 70 00 – 3/33

g. Minority Tracking or Participation Form – found on page Special instructions, SI Section 00 73 02-3/4 will be discussed at Pre-Construction/Notice to Proceed meeting.

h. Insurance and Bonds, Article 11, page AIASC Section 00 73 03 12/17-14/17

i. Bid the project as you see it. Change Orders are intended for unforeseen conditions. Frivolous or non essential change orders will not be tolerated.

j. We plan to award the entire project but it will be determined based on fund availability. Bidders are to hold bids for a period of 60 days.

k. Liquidated Damages are in the amount of **\$861.11** with calendar days of **215** to complete the project. Liquidated Damages WILL BE ASSESSED if project is not completed within **215** days without justifiable time extension requested and approved. The **215** days includes time needed for processing of close out documents and final pay applications.

5. Take questions

6. Turn conference over to project officer and architect for technical portion.

41. SUBCONTRACTOR COST OR PRICING DATA-PRICE ADJUSTMENTS - Insert the following clause in all contracts, both formally advertised and negotiated, which exceed \$100,000:

a. Paragraphs (b) and (c) of this Clause shall become operative with respect to any modification made pursuant to one or more provisions of this contract which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000. The requirements of this Clause shall be limited to such modifications.

b. The Contractor shall require Subcontractors hereunder to submit cost or pricing data under the following circumstances: (i) prior to the award of any subcontract the amount of which is expected to exceed \$100,000 when entered into; (ii) prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000; except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.

c. The Contractor shall require Subcontractors to certify that to the best of their knowledge and belief the cost and pricing data submitted under (b) above is accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract change or modification.

d. The Contractor shall insert the substance of this Clause including this paragraph (d) in each subcontract which exceeds \$100,000.

42. BUY AMERICAN ACT

a. Agreement. In accordance with the Buy American Act (41 U.S.C. 10a-10d), the Contractor agrees that only domestic construction material will be used (by the Contractor, Subcontractors, materialmen, and supplies) in the performance of this contract, except for nondomestic construction material listed in the "Nondomestic Construction Materials" Clause, if any, of this contract.

b. Domestic Construction Material. "Construction Material" means any article, material, or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a "Domestic Construction Material" if it has been mined or produced in the United States. A manufactured construction material is a "Domestic Construction Material" if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceed 50 percent of the cost of all its components. "Component" means any article, material, or supply directly incorporated in a construction material.

c. Domestic Component. A component shall be considered to have been "mined, produced, or manufactured in the United States" (regardless of its source in fact) if the article, material, or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

11. MATERIAL AND WORKMANSHIP - Unless otherwise specifically provided for in the Contract Documents, all equipment, materials, and articles incorporated in the work covered by this contract are to be new and of the most suitable grade of their respective kinds for the purpose intended, and all workmanship shall be first class. Where equipment, materials, or articles are referred to in the Contract Documents as "equal to" any particular standard, the State Contract Officer, Chief and/or Contracting Officer shall decide the question of equality. The Contractor shall furnish to the State Contract Officer, Chief and/or Contracting Officer for approval the name of the manufacturer of machinery, mechanical and other equipment which he/she contemplates incorporating in the work, together with their performance capacities and other pertinent information. When required by the Contract Documents, or when called for by the State Contract Officer, Chief and/or Contracting Officer, the Contractor shall furnish to the State Contract Officer, Chief and/or Contracting Officer for approval full information concerning the materials or articles which he/she contemplates incorporating in the work. Samples of materials shall be submitted for approval when so directed. Machinery, equipment, materials, and articles installed or used without such approval shall be at the risk of subsequent rejection. The State Contract Officer, Chief and/or Contracting Officer may in writing require the Contractor to remove from the work site such employee as the State Contract Officer, Chief and/or Contracting Officer deems incompetent, careless, insubordinate, or otherwise objectionable, or whose continued employment on the work site is deemed by the State Contract Officer, Chief and/or Contracting Officer to be contrary to the public interest.

12. HAZARDOUS WASTE MATERIALS - The Contractor is responsible for the removal and disposal of any hazardous waste materials encountered in the performance of the Contract requirements. Hazardous Containing Materials [HCM] include, but are not limited to, Asbestos and Lead Paint and should be identified and removed as a part of the Contract. The absence of details does not relieve the Contractor from the responsibility of removal and disposal; but, a Change Order could be executed in the absence of identified HCM in the documents.

13. CONTRACT DRAWINGS AND SPECIFICATIONS

a. Omissions from the drawings or specifications or the miss-description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or miss-described details of the work but they shall be performed as if fully correctly set forth and described in the drawings and specifications.

b. The Contractor shall check all drawings furnished him/her immediately upon their receipt and shall promptly notify the State Contract Officer, Chief and/or Contracting Officer of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

b. **Bid Under \$50,000:** If a Bidder submits a bid not exceeding \$50,000, no Certificate of Responsibility number is required; however, a notation stating the bid does not exceed \$50,000 must appear on the face of the envelope, or a Certificate of Responsibility number. SEE Directions for Mailing Bids, section 00 21 13, page DMB-1/1 for example.

c. **Bid Over \$50,000:** Each Bidder submitting a bid in excess of \$50,000 must show its Certificate of Responsibility number on the bid and on the face of the envelope containing the bid. SEE Directions for Mailing Bids, section 00 21 13, page DMB-1/1 for example.

d. **Joint Venture Bid:** When multiple Contractors submit a joint venture bid in excess of \$50,000, a *joint venture* Certificate of Responsibility number must be shown on the bid and on the face of the envelope containing the bid. If the Multiple-Contractor joint venture has no *joint venture* Certificate of Responsibility number, each of the Contractors participating in the bid must indicate their individual Certificate of Responsibility numbers on the bid and on the face of the envelope.

12. BID SECURITY-BIDDING REQUIREMENTS

All bids shall be accompanied by a Bid Security in the sum of five percent (5%) of the contract price. Bid Security shall be a cashier's or certified check or a duly executed copy of Bid Bond, using the Mississippi Military Department's Standard Form 24 or equivalent Form from the bidders Bonding Company. Contractors bidding using the Standard Form 24 will be furnished a copy from the Mississippi Military Department, State Purchasing and Contracting Division. (Example shown in Contract Forms Section, page BB-1-2).

13. CONTRACT BOND

Prior to award of contract, the Contractor will be expected to execute a Performance Bond, Standard Form 25 and a Payment Bond, Standard Form 25-A or equivalent Form from the bidders Bonding Company. When executed, this document will be bound here with final Contract Documents. (Example shown in Contract Forms Section, pages PaB 1-2 & PeB 1-2).

14. NONRESIDENT CONTRACTOR

When a Nonresident Contractor submits a bid for a public project, he/she shall attach thereto one of the following:

a. A copy of his/her resident state's current law pertaining to such state's treatment of Nonresident Contractors. As used in this section, the term "Resident Contractors" includes a nonresident person, firm or corporation that has been qualified to do business in this state and has maintained a permanent full-time office in the State of Mississippi for two (2) years prior to submission of the bid and the subsidiaries and affiliates of such a person, firm or corporation.

b. A statement indicating the State of (Name of the State) has no resident contractor preference law.

C&D Debris Report

PROJECT NAME and NUMBER _____
PAY APP NUMBER _____
LOCATION _____
DATE _____

DEBRIS					DIVERTED FROM	
QUANTITY (#)	TONS (✓)	LBS (✓)	YARDS (✓)	LANDFILL (Y or N)		
					ABC-Asphalt	
					ABC-Brick	
					ABC-Concrete	
					ABC-OTHER (C&D Masonry/Asphalt)	
					ABC-Stone	
					Land-Crushed Stone/Base	
					Land-OTHER (C&D Land Clearing)	
					Land-Soil, Lead-Tainted, Non-Hazardous	
					Land-Soil, Petroleum-Tainted	
					Land-Soil, Subsoil	
					Land-Soil, Top	
					Land-Vegetation/Timber (Tree Trunks & Limbs)	
					Metal-Aluminum	
					Metal-Copper	
					Metal-Mixed Metal	
					Metal-OTHER (C&D Metal)	
					Metal - Steel	
					OD/I/M - Ceiling Tile	
					OD/I/M - Composition Roof	
					OD/I/M - Doors/Windows/Stairs/Cabinets	
					OD/I/M - Glass	
					OD/I/M - Gypsum/Plaster	
					OD/I/M - Insulation	
					OD/I/M - OTHER (C&D Other)	
					OD/I/M - Paper	
					OD/I/M - Plastic	
					OD/I/M - Siding	
					Recycled C&D Debris	
					Wood - Finished	
					Wood - OTHER (C&D Wood)	
					Wood - Structural	
					Wood - Treated	
					OTHER:	
					OTHER:	
					OTHER:	
					OTHER:	
					OTHER:	
					OTHER:	
					OTHER:	

MISSISSIPPI MILITARY DEPARTMENT

Minority Tracking or Participation Form

Any responses will be deemed public information and may be incorporated into reporting information compiled by the Owner in the following manner: Contractors that listed minority participation, Contractors that did not list minority participation and Contractors that submitted an incomplete (partially filled-out or blank) form.

Section 00 43 00: SCOPE OF WORK

1.01 General Description of work covered by Contract Documents

Section 00 73 02, paragraph 8, page, SI Section 00 73 02 - 2/3

The Prime General Contractor will submit to the Owner within seven (7) days from the Notice to Proceed, a completed *Minority Tracking Form* outlining the use of minority subcontractors that will be used on the project.

Minority - A person who is a citizen or lawful permanent resident of the United States and who is the following: African American, Hispanic American, Asian American, American Indian or Female

Project Name, Location and Number: _____

General Contractor: (Name) _____

Check the Following Appropriate Box

☐

There are NO minority participants included in this bid proposal.

☐

There are minority participants included in this bid proposal. The minority participants may be defined as: Subcontractor(s) or Supplier(s).

List minority participants and their discipline/responsibility per the above or per Construction Specification Institution (CSI) sixteen (16) divisions.

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

CONDITIONS OF THE CONTRACT

SPECIAL INSTRUCTIONS

Page 2 of 2 (Submit if necessary)
Minority Participation Form

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Name: _____

Division: _____

Amount \$ _____

Article 11
INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.3 Change this first sentence of this Subparagraph to read as follows:

Certificate of insurance acceptable to the Owner shall be submitted to the COC/CO prior to issuance of the Notice-To-Proceed and thereafter upon renewal or replacement of each required policy of insurance.

11.1.4 Delete this Subparagraph in its entirety.

11.1.5 Add a new Subparagraph as follows:

The Contractor's limits of liability shall be written for not less than the following:

.1 GENERAL LIABILITY:

Commercial General Liability

(Including XCU if project is over \$500,000.00)

<i>General Aggregate.....</i>	<i>\$ 1,000,000.00 Aggregate</i>
<i>Products & Completed Operations.....</i>	<i>\$ 1,000,000.00 Aggregate</i>
<i>Personal & Advertising Injury.....</i>	<i>\$ 500,000.00 Per Occurrence</i>
<i>Bodily Injury & Property Damage.....</i>	<i>\$ 1,000,000.00 Per Occurrence</i>
<i>Fire Damage Liability.....</i>	<i>\$ 50,000.00 Per Occurrence</i>
<i>Medical Expense.....</i>	<i>\$ 5,000.00 Per Person</i>

.2 OWNERS & CONTRACTORS PROTECTIVE LIABILITY:

<i>Bodily Injury & Property Damage.....</i>	<i>\$ 1,000,000.00 Aggregate</i>
<i>Bodily Injury & Property Damage.....</i>	<i>\$ 500,000.00 Per Occurrence</i>

.3 AUTOMOBILE LIABILITY:

(Owned, Non-owned & Hired Vehicles)

Contractor Insurance Option Number 1:

<i>Bodily Injury & Property Damage.....</i>	<i>\$ 500,000.00 Per Occurrence</i>
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(Combined Single Limit)

Contractor Insurance Option Number 2:

SSF

AIASC SECTION 00 73 03 12/17

<i>Bodily Injury.....</i>	<i>\$ 250,000.00 Per Person</i>
<i>Bodily Injury.....</i>	<i>\$ 500,000.00 Per Accident</i>
<i>Property Damage.....</i>	<i>\$ 100,000.00 Per Occurrence</i>

.4 EXCESS LIABILITY:

(Umbrella on projects over \$500,000)

<i>Bodily Injury & Property Damage.....</i>	<i>\$ 1,000,000.00 Aggregate</i>
---	----------------------------------

(Combined Single Limit)

.5 WORKERS' COMPENSATION:

(As required by Statute)

EMPLOYERS' LIABILITY:

<i>Accident.....</i>	<i>\$ 100,000.00 Per Occurrence</i>
<i>Disease.....</i>	<i>\$ 500,000.00 Policy Limit</i>
<i>Disease.....</i>	<i>\$ 100,000.00 Per Employee</i>

.6 PROPERTY INSURANCE:

Builder's Risk \$ Equal to Value of Work
or
Installation Floater \$ Equal to Value of Work

NOTE: Builder's Risk Insurance will NOT be required when project is demolition ONLY. It will be required for all other projects including paving..

11.1.6 Add a new Subparagraph as follows:

If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the Contract; the termination date, or the policy, or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment.

11.2 OWNER'S LIABILITY INSURANCE

Delete this Paragraph in its entirety and substitute the following:

*The Contractor shall purchase and maintain such insurance as will protect the Owner from his contingent liability to others for damages because of bodily injury, including death, and property damage, which may arise from operations under this Contract and other liability for damages which the Contractor is required to insure under any provision of this Contract. Certificate of this insurance will be filed with the Owner and will be the same limits set forth in 11.1.*5.*

11.3 PROPERTY INSURANCE (BUILDER'S RISK OR INSTALLATION FLOATER)

11.3.1 Change the first line in this Subparagraph to read as follows:

The Contractor shall purchase....

11.3.1.2 Delete this Clause under Subparagraph 11.3.1 in its entirety.

11.3.1.3 Change the following Clause in this Subparagraph to read as follows:

If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles.

11.3.2 Delete this Subparagraph in its entirety.

11.3.3 Delete this Subparagraph in its entirety.

SSF

AIASC SECTION 00 73 03 13/17

11.3.4 Delete this Subparagraph in its entirety.

11.3.5 Delete this Subparagraph in its entirety.

11.3.6 Delete this Subparagraph in its entirety.

11.3.7 Delete this Subparagraph in its entirety.

11.3.8 Delete this Subparagraph in its entirety

11.3.9 Delete this Subparagraph in its entirety

11.3.10 Change this Subparagraph to read as follows:

The Owner as fiduciary shall have power to adjust and settle a loss with Insurers unless one of the parties in interest shall object in writing within five (5) days after occurrence of loss.

July 26, 2016

ADDENDUM NO. 1

PROJECT: Maintenance & Repairs to Building S-219
Camp McCain
Grenada, Mississippi

FROM: Atherton Consulting Engineers, Inc.
1900 Lakeland Drive, Suite 1
Jackson, Mississippi 39216

The following additions, changes, clarifications and/or substitutions to the Project Drawings as indicated are hereby made a part of the Contract Documents. Acknowledge receipt of this Addendum by inserting its number and date in the Proposal Form where indicated.

- Item No. 1: Specifications: Delete Section 211316, Dry Pipe Sprinkler Systems.
- Item No. 2: Specifications: Add attached Section 211000, Wet Pipe Sprinkler Systems.
- Item No. 3: Specifications: Replace Section 283100 entirely with attached Section 283100, Fire Alarm and Mass Notification System.
- Item No. 4: Drawing, Sheet MD1.0: Added note to remove existing ceiling fans in Meeting Room 21 as shown on attached Drawing MD1.0R1.
- Item No. 5: Drawing, Sheet M1.0, add the following General Note:
- General Note:
- 1) All new roof curbs for exhaust fans and intake caps are to be coordinated with roofing manufacturer so that the curb base profile matches the metal roofing panel profile and maintains all roof warranties.
- Item No. 6: Drawing, Sheet E1.0: Added tamper and flow switch symbol and description to electrical legend as shown on attached Drawing E1.0R.
- Item No. 7: Drawing, Sheet E1.0: Revised Lighting Fixture Schedule as shown on attached Drawing ____ E1.0R.
- Item No. 8: Drawing, Sheet E1.0: Added General Demolition Notes as shown on attached Drawing E1.0R.
- Item No. 9: Drawing, Sheet E1.1: Revised description of Base Bid and Deduct Alternate #1 in General Notes to match Architectural notes. See attached Drawing E1.1R.
- Item No. 10: Drawing Sheet E1.1: Added exit signs as shown on attached Drawing E1.1R.
- Item No. 11: Drawing, Sheet E2.1: Added flow and tamper switches for fire riser and post indicator valve as shown on attached Drawing E2.1R.

Item No. 12: Drawing, Sheet E2.1: Added General Note with description of wall mounted devices. See attached Drawing E2.1R.

END OF ADDENDUM NO. 1

SECTION 211000 - WET PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Fire-department connections.
4. Sprinklers.
5. Alarm devices.
6. Pressure gages.

1.2 SYSTEM DESCRIPTIONS

- A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.3 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- B. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1. Available fire-hydrant flow test records indicate the following conditions:

- a. Date:
- b. Time: Performed by:
- c. Location of Residual Fire Hydrant R:
- d. Location of Flow Fire Hydrant F:
- e. Static Pressure at Residual Fire Hydrant R:
- f. Measured Flow at Flow Fire Hydrant F:
- g. Residual Pressure at Residual Fire Hydrant R:

- C. Sprinkler system design shall be approved by authorities having jurisdiction.

1. Margin of Safety for Available Water Flow and Pressure:
percent, including losses through water-service piping, valves, and backflow preventers.
2. Sprinkler Occupancy Hazard Classifications:
 - a. Building Service Areas: Ordinary Hazard, Group 1.

3. Minimum Density for Automatic-Sprinkler Piping Design:
 - a. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
4. Maximum Protection Area per Sprinkler: Per UL listing.
5. Maximum Protection Area per Sprinkler:
 - a. Office Spaces: 120 sq. ft. 225 sq. ft.
 - b. Storage Areas: 130 sq. ft.
 - c. Mechanical Equipment Rooms: 130 sq. ft.
 - d. Electrical Equipment Rooms: 130 sq. ft.
 - e. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
6. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:
 - a. Ordinary-Hazard Occupancies: 250 gpm for 60 to 90 minutes
 - b. Extra-Hazard Occupancies: 500 gpm for 90 to 120 minutes
- D. Seismic Performance: Sprinkler piping shall withstand the effects of earthquake motions determined according to NFPA 13.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings shall be submitted to the State Fire Marshal's Office through FMO office as required by UFC 3-600-01, Section 4-2.3.4.1.
- C. Shop Drawings: Wet pipe sprinkler systems drawings are to be sealed/stamped by a Fire Protection Engineer with Level 3 certification. Include plans, elevations, sections, details, and attachments to other work.
 1. Wiring Diagrams: For power, signal, and control wiring.
- D. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Qualification Data: For qualified Installer and professional engineer.
- F. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- G. Welding certificates.

- H. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- I. Field quality-control reports.
- J. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer as required by D.O. D. Uniform Facility Criteria 3-600-01.
- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
 - 1. NFPA 13, "Installation of Sprinkler Systems."
 - 2. NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances."

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.2 STEEL PIPE AND FITTINGS

- A. Standard Weight, Black-Steel Pipe: ASTM A 53/A 53M, Type E Pipe ends may be factory or field formed to match joining method.
- B. Schedule 30, Black-Steel Pipe: ASTM A 135; ASTM A 795/A 795M, Type E; or ASME B36.10M, wrought steel; with wall thickness not less than Schedule 30 and not more than Schedule 40. Pipe ends may be factory or field formed to match joining method.

- C. Thinwall Black-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, threadable, with wall thickness less than Schedule 30 and equal to or greater than Schedule 10. Pipe ends may be factory or field formed to match joining method.
- D. Schedule 5 Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, lightwall, with plain ends.
- E. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- F. Uncoated, Steel Couplings: ASTM A 865, threaded.
- G. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- H. Malleable- or Ductile-Iron Unions: UL 860.
- I. Cast-Iron Flanges: ASME 16.1, Class 125.
- J. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
- K. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
- L. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Tyco Fire & Building Products LP.
 - c. Victaulic Company.
 - 2. Pressure Rating: 175 psig minimum.
 - 3. Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.
- M. Steel Pressure-Seal Fittings: UL 213, FM-approved, 175-psig pressure rating with steel housing, rubber O-rings, and pipe stop; for use with fitting manufacturers' pressure-seal tools.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Victaulic Company.

2.3 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick.
 - 1. Class 125, Cast-Iron Flat-Face Flanges: Full-face gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
 - 1. Valves shall be UL listed or FM approved.
 - 2. Minimum Pressure Rating: 175 psig.
- B. Check Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Anvil International, Inc.
 - b. Milwaukee Valve Company.
 - c. Mueller Co.; Water Products Division.
 - d. NIBCO INC.
 - e. Potter Roemer.
 - f. Tyco Fire & Building Products LP.
 - g. Victaulic Company.
 - 3. Standard: UL 312.
 - 4. Pressure Rating: 250 psig minimum.
 - 5. Type: Swing check.
 - 6. Body Material: Cast iron.
 - 7. End Connections: Flanged or grooved.
- C. Bronze OS&Y Gate Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Milwaukee Valve Company.

- b. NIBCO INC.
 - c. United Brass Works, Inc.
- 3. Standard: UL 262.
 - 4. Pressure Rating: 175 psig.
 - 5. Body Material: Bronze.
 - 6. End Connections: Threaded.
- D. Iron OS&Y Gate Valves:
- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Milwaukee Valve Company.
 - b. Mueller Co.; Water Products Division.
 - c. NIBCO INC.
 - d. Tyco Fire & Building Products LP.
 - e. Watts Water Technologies, Inc.
 - 3. Standard: UL 262.
 - 4. Pressure Rating: 250 psig minimum.
 - 5. Body Material: Cast or ductile iron.
 - 6. End Connections: Flanged or grooved.
- E. Indicating-Type Butterfly Valves:
- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Anvil International, Inc.
 - b. Milwaukee Valve Company.
 - c. NIBCO INC.
 - d. Tyco Fire & Building Products LP.
 - e. Victaulic Company.
 - 3. Standard: UL 1091.
 - 4. Pressure Rating: 175 psig minimum.
 - 5. Valves NPS 2 (DN 50) and Smaller:
 - a. Valve Type: Ball or butterfly.
 - b. Body Material: Bronze.
 - c. End Connections: Threaded.
 - 6. Valves NPS 2-1/2 (DN 65) and Larger:

- a. Valve Type: Butterfly.
 - b. Body Material: Cast or ductile iron.
 - c. End Connections: Flanged, grooved, or wafer.
7. Valve Operation: Integral electrical, 115-V ac, prewired, single-circuit, supervisory switch indicating device.

2.5 TRIM AND DRAIN VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.

B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Milwaukee Valve Company.
 - c. NIBCO INC.
 - d. Potter Roemer.
 - e. Tyco Fire & Building Products LP.
 - f. Victaulic Company.

2.6 SPECIALTY VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

B. Alarm Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Reliable Automatic Sprinkler Co., Inc.
 - b. Tyco Fire & Building Products LP.
 - c. Victaulic Company.

3. Standard: UL 193.
4. Design: For horizontal or vertical installation.
5. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, retarding chamber, and fill-line attachment with strainer.
6. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.
7. Drip Cup Assembly: Pipe drain with check valve to main drain piping.

C. Automatic (Ball Drip) Drain Valves:

1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Reliable Automatic Sprinkler Co., Inc.
 - b. Tyco Fire & Building Products LP.
2. Standard: UL 1726.
3. Pressure Rating: 175 psig minimum.
4. Type: Automatic draining, ball check.
5. Size: NPS 3/4 (DN 20).
6. End Connections: Threaded.

2.7 FIRE-DEPARTMENT CONNECTIONS

A. Flush-Type, Fire-Department Connection:

1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Guardian Fire Equipment, Inc.
 - b. Potter Roemer.
3. Standard: UL 405.
4. Type: Flush, for wall mounting.
5. Pressure Rating: 175 psig minimum.
6. Body Material: Corrosion-resistant metal.
7. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
8. Caps: Brass, lugged type, with gasket and chain.
9. Escutcheon Plate: Rectangular, brass, wall type.
10. Outlet: With pipe threads.
11. Body Style:
12. Number of Inlets: Two.
13. Outlet Location:
14. Escutcheon Plate Marking: Similar to AUTO SPKR & STANDPIPE

15. Finish: Rough brass or bronze.
16. Outlet Size:

2.8 SPRINKLER SPECIALTY PIPE FITTINGS

A. Branch Outlet Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Tyco Fire & Building Products L.P.
 - c. Victaulic Company.
2. Standard: UL 213.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
5. Type: Mechanical-T and -cross fittings.
6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
8. Branch Outlets: Grooved, plain-end pipe, or threaded.

B. Flow Detection and Test Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Reliable Automatic Sprinkler Co., Inc.
 - b. Tyco Fire & Building Products L.P.
 - c. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

C. Branch Line Testers:

1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Potter Roemer.
2. Standard: UL 199.

3. Pressure Rating: 175 psig minimum.
4. Body Material: Brass.
5. Size: Same as connected piping.
6. Inlet: Threaded.
7. Drain Outlet: Threaded and capped.
8. Branch Outlet: Threaded, for sprinkler.

D. Sprinkler Inspector's Test Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Tyco Fire & Building Products L.P.
 - b. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with sight glass.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

E. Adjustable Drop Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Merit Manufacturing; a division of Anvil International, Inc.
2. Standard: UL 1474.
3. Pressure Rating: 250 psig minimum.
4. Body Material: Steel pipe with EPDM-rubber O-ring seals.
5. Size: Same as connected piping.
6. Length: Adjustable.
7. Inlet and Outlet: Threaded.

F. Flexible, Sprinkler Hose Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fivalco Inc.
 - b. FlexHead Industries, Inc.
 - c. Gateway Tubing, Inc.
2. Standard: UL 1474.

3. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
4. Pressure Rating: 175 psig minimum.
5. Size: Same as connected piping, for sprinkler.

2.9 SPRINKLERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Reliable Automatic Sprinkler Co., Inc.
2. Tyco Fire & Building Products LP.
3. Victaulic Company.

- B. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Residential Sprinklers: 175 psig maximum.
3. Pressure Rating for Automatic Sprinklers: 175 psig minimum.
4. Pressure Rating for High-Pressure Automatic Sprinklers: 250 psig minimum.

- C. Automatic Sprinklers with Heat-Responsive Element:

1. Early-Suppression, Fast-Response Applications: UL 1767, UL 199.
2. Residential Applications: UL 1626.
3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

- D. Sprinkler Finishes:

1. Chrome plated.
2. Bronze.
3. Painted.

- E. Special Coatings:

1. Wax.
2. Lead.
3. Corrosion-resistant paint.

- F. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.

1. Ceiling Mounting: Chrome-plated steel, two piece, with 1-inch vertical adjustment.
2. Sidewall Mounting: Chrome-plated steel, one piece, flat.

G. Sprinkler Guards:

1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Reliable Automatic Sprinkler Co., Inc.
 - b. Tyco Fire & Building Products LP.
 - c. Victaulic Company.
2. Standard: UL 199.
3. Type: Wire cage with fastening device for attaching to sprinkler.

2.10 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Water-Motor-Operated Alarm:

1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Tyco Fire & Building Products LP.
 - b. Victaulic Company.
2. Standard: UL 753.
3. Type: Mechanically operated, with Pelton wheel.
4. Alarm Gong: Cast aluminum with red-enamel factory finish.
5. Size: 10-inch diameter.
6. Components: Shaft length, bearings, and sleeve to suit wall construction.
7. Inlet: NPS 3/4 (DN 20).
8. Outlet: NPS 1 (DN 25) drain connection.

C. Water-Flow Indicators:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ADT Security Services, Inc.
 - b. Potter Electric Signal Company.
 - c. System Sensor; a Honeywell company.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.

5. Type: Paddle operated.
6. Pressure Rating: 250 psig.
7. Design Installation: Horizontal or vertical.

D. Valve Supervisory Switches:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire-Lite Alarms, Inc.; a Honeywell company.
 - b. Potter Electric Signal Company.
 - c. System Sensor; a Honeywell company.
2. Standard: UL 346.
3. Type: Electrically supervised.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design: Signals that controlled valve is in other than fully open position.

2.11 PRESSURE GAGES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Ashcroft, Inc.
 2. Brecco Corporation.
- B. Standard: UL 393.
- C. Dial Size: 3-1/2- to 4-1/2-inch diameter.
- D. Pressure Gage Range: 0 to 250 psig minimum.
- E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.
- F. Air System Piping Gage: Include "AIR" or "AIR/WATER" label on dial face.

PART 3 - EXECUTION

3.1 SERVICE-ENTRANCE PIPING

- A. Connect sprinkler piping to water-service piping for service entrance to building. Comply with requirements for exterior piping in Section 211100 "Facility Fire-Suppression Water-Service Piping."
- B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories indicated at connection to water-service piping. Comply with requirements for backflow preventers in Section 211100 "Facility Fire-Suppression Water-Service Piping."

- C. Install shutoff valve, check valve, pressure gage, and drain at connection to water service.

3.2 WATER-SUPPLY CONNECTIONS

- A. Connect sprinkler piping to building's interior water-distribution piping. Comply with requirements for interior piping in Section 221116 "Domestic Water Piping."
- B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories indicated at connection to water-distribution piping. Comply with requirements for backflow preventers in Section 221119 "Domestic Water Piping Specialties."
- C. Install shutoff valve, check valve, pressure gage, and drain at connection to water supply.

3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.
- C. Install seismic restraints on piping. Comply with requirements for seismic-restraint device materials and installation in NFPA 13.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 (DN 50) and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.
- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.
- J. Install automatic (ball drip) drain valve at each check valve for fire-department connection, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- K. Install alarm devices in piping systems.

- L. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
- M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 (DN 8) and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.
- N. Fill sprinkler system piping with water.
- O. Install electric heating cables and pipe insulation on sprinkler piping in areas subject to freezing. Comply with requirements for heating cables in Section 210533 "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Section 210700 "Fire-Suppression Systems Insulation."
- P. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- Q. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- R. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210518 "Escutcheons for Fire-Suppression Piping."

3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 (DN 50) and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Pressure-Sealed Joints: Join lightwall steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- J. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- K. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- L. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- M. Steel-Piping, Pressure-Sealed Joints: Join Schedule 5 steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- N. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Specialty Valves:
1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
 2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.

3.6 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.
- C. Install sprinklers into flexible, sprinkler hose fittings and install hose into bracket on ceiling grid.

3.7 FIRE-DEPARTMENT CONNECTION INSTALLATION

- A. Install wall-type, fire-department connections.
- B. Install automatic (ball drip) drain valve at each check valve for fire-department connection.

3.8 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.9 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Coordinate with fire-alarm tests. Operate as required.
 - 6. Coordinate with fire-pump tests. Operate as required.
 - 7. Verify that equipment hose threads are same as local fire-department equipment.
- C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.10 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Remove and replace sprinklers with paint other than factory finish.

3.11 PIPING SCHEDULE

- A. Piping between Fire-Department Connections and Check Valves: Galvanized, standard-weight steel pipe with threaded ends; cast-iron threaded fittings; and threaded, grooved ends; grooved-end fittings; grooved-end-pipe couplings; and grooved joints.
- B. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- C. Wet-pipe sprinkler system, NPS 2 and smaller the following:
 - 1. Standard-weight black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- D. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 6 shall be the following:
 - 1. Standard-weight black-steel pipe with grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

3.12 SPRINKLER SCHEDULE

- A. Use sprinkler types in subparagraphs below for the following applications:
 - 1. Rooms without Ceilings: Upright sprinklers.
 - 2. Rooms with Suspended Ceilings: Pendent, recessed, flush, and concealed sprinklers as indicated.
 - 3. Wall Mounting: Sidewall sprinklers.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
 - 1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
 - 2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
 - 3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
 - 4. Upright Pendent and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax coated where exposed to acids, chemicals, or other corrosive fumes.

END OF SECTION

SECTION 283100 - FIRE ALARM AND MASS NOTIFICATION SYSTEM

PART 1 GENERAL

1.1 RELATED SECTIONS

Section 260000 ELECTRICAL GENERAL, applies to this section, with the additions and modifications specified herein. In addition, refer to the following sections for related work and coordination:

Section 230000 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS

Section 260519 LOW-VOLTAGE POWER CONDUCTORS AND CABLES

Section 260533 RACEWAYS, OUTLET BOXES, AND JUNCTION BOXES FOR ELECTRICAL SYSTEMS.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACOUSTICAL SOCIETY OF AMERICA (ASA)

ASA S3.2 (2009) Method for Measuring the Intelligibility of Speech Over Communication Systems (ASA 85)

ASME INTERNATIONAL (ASME)

ASME A17.1/CSA B44 (2007; Addenda A 2008; Addenda B 2009) Safety Code for Elevators and Escalators

FM GLOBAL (FM)

FM APP GUIDE (updated on-line) Approval Guide
<http://www.approvalguide.com/>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C62.41.1 (2002; R 2008) Guide on the Surges Environment in Low-Voltage (1000 V and Less) AC Power Circuits

IEEE C62.41.2 (2002) Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 60268-16 (2003) Sound System Equipment - Part 16: Objective Rating Of Speech Intelligibility By Speech Transmission Index; Ed 3.0

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 7240-16 (2007) Fire Detection And Alarm Systems — Part 16: Sound System Control And Indicating Equipment

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101 (2009; TIA 09-1; TIA 09-2) Life Safety Code

NFPA 170 (2009) Standard for Fire Safety and Emergency Symbols

NFPA 241 (2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NFPA 70 (2011; TIA 11-1; Errata 2011) National Electrical Code

NFPA 72 (2010; TIA 10-1; TIA 10-2; TIA 10-3; TIA 10-4) National Fire Alarm and Signaling Code

NFPA 90A (2009; Errata 09-1) Standard for the Installation of Air Conditioning and Ventilating Systems

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

47 CFR 15 Radio Frequency Devices

47 CFR 90 Private Land Mobile Radio Services

UNDERWRITERS LABORATORIES (UL)

UL 1480 (2003; R 2005 - R 2010) Standard for Speakers for Fire Alarm, Emergency, and Commercial and Professional Use

UL 1638 (2001; R thru 2008) Visual Signaling Appliances - Private Mode Emergency and General Utility Signaling

UL 1971 (2002; R thru 2008) Signaling Devices for the Hearing Impaired

UL 2017 (2008; R 2009) General-Purpose Signaling Devices and Systems

UL 268 (2009) Smoke Detectors for Fire Alarm Systems

UL 268A (2008; R 2009) Smoke Detectors for Duct Application

UL 464 (2009) Standard for Audible Signal Appliances

UL 521	(1999; R thru 2010) Heat Detectors for Fire Protective Signaling Systems
UL 864	(2003; R thru 2010) Standard for Control Units and Accessories for Fire Alarm Systems
UL Electrical Constructn	(2009) Electrical Construction Equipment Directory
UL Fire Prot Dir	(2010) Fire Protection Equipment Directory

1.3 DEFINITIONS

Wherever mentioned in this specification or on the drawings, the equipment, devices, and functions shall be defined as follows:

- a. Analog/Addressable System: A system where multiple signals are transmitted via the same conduction path to a remote fire alarm control unit and fire alarm control panel, decoded and separated so that each signal will initiate the specified response.
- b. Hard Wired System: A system where alarm and supervisory initiating devices are directly connected, through individual dedicated conductors, to a central control panel without the use of analog/addressable circuits or devices.
- c. Interface Device: An addressable device that interconnects hard wired systems or devices to an analog/addressable system.
- d. Remote Fire Alarm and Mass Notification Control Unit: A control panel, electronically remote from the fire alarm and mass notification control panel, that receives inputs from automatic and manual fire alarm devices; may supply power to detection devices and interface devices; may provide transfer of power to the notification appliances; may provide transfer of condition to relays or devices connected to the control unit; and reports to and receives signals from the fire alarm control panel.
- e. Fire Alarm and Mass Notification Control Panel (FACP/FMCP): A master control panel having the features of a fire alarm and mass notification control unit and fire alarm and mass notification control units are interconnected. The panel has central processing, memory, input and output terminals, video display units (VDUs), and printers.
- f. Terminal Cabinet: A steel cabinet with locking, hinge-mounted door that terminal strips are securely mounted.

1.4 SYSTEM DESCRIPTION

1.4.1 Scope

- a. This work includes completion of design and providing new, complete building systems, and modifying the existing campus analog/addressable fire alarm and mass notification system as described herein and on the contract drawings. Include in the system wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm, and supervisory signal initiating devices, alarm notification appliances, supervising station fire alarm system

transmitter, and other accessories and miscellaneous items required for a complete operating system even though each item is not specifically mentioned or described. Provide systems complete and ready for operation. The overall system shall be designed around an EST3 control panel, or approved equal. Individual panels shall utilize a network transmission back to Guard Station Fireworks Graphic Control Workstation. It shall meet all requirements of UFC 4-021-01.

b. Provide equipment, materials, installation, workmanship, inspection, and testing in strict accordance with the required and advisory provisions of NFPA 72, ISO 7240-16, IEC 60268-16, except as modified herein. The system layouts on the drawings show the intent of coverage and are shown in suggested locations. Final quantity, system layout, and coordination are the responsibility of the Contractor. A single fire alarm control panel is indicated in each building.

c. Where remote fire alarm control units are needed, they shall be provided at a terminal cabinet location. Each remote fire alarm control unit shall be powered from a wiring riser specifically for that use or from a local emergency power panel located on the same floor as the remote fire alarm control unit. Where remote fire control units are provided, equipment for notification appliances may be located in the remote fire alarm control units.

1.4.2 Technical Data and Computer Software

Technical data and computer software (meaning technical data that relates to computer software) that are specifically identified in this project, and may be defined/required in other specifications, shall be delivered, strictly in accordance with the CONTRACT CLAUSES. Identify data delivered by reference to the particular specification paragraph against which it is furnished. Data to be submitted shall include complete system, equipment, and software descriptions. Descriptions shall show how the equipment will operate as a system to meet the performance requirements of this contract. The data package shall also include the following:

- a. Identification of programmable portions of system equipment and capabilities.
- b. Description of system revision and expansion capabilities and methods of implementation detailing both equipment and software requirements.
- c. Provision of operational software data on all modes of programmable portions of the fire alarm and detection system.
- d. Description of Fire Alarm Control Panel equipment operation.
- e. Description of auxiliary and remote equipment operations.
- f. Library of application software.
- g. Operation and maintenance manuals.

1.4.3 Keys

Keys and locks for equipment shall be identical. Provide not less than six keys of each type required. All keys and locks shall be mastered to a single key as required by the local AHJ.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 013300 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Annotated catalog data, in table format on the drawings, showing manufacturer's name, model, voltage, and catalog numbers for equipment and components. Submitted shop drawings shall not be smaller than ISO A1.

Wiring Diagrams; G

Point-to-point wiring diagrams showing the points of connection and terminals used for electrical field connections in the system, including interconnections between the equipment or systems that are supervised or controlled by the system. Diagrams shall show connections from field devices to the FACP and remote fire alarm control units, initiating circuits, switches, relays and terminals.

Complete riser diagrams indicating the wiring sequence of devices and their connections to the control equipment. Include a color code schedule for the wiring. Include floor plans showing the locations of devices and equipment.

System Layout; G

Plan view drawing showing device locations, terminal cabinet locations, junction boxes, other related equipment, conduit routing, wire counts, circuit identification in each conduit, and circuit layouts for all floors. Drawings shall comply with the requirements of NFPA 170, Fire Safety Symbols.

System Operation; G

A complete list of device addresses and corresponding messages.

Notification Appliances; G

Data on each circuit to indicate that there is at least 25 percent spare capacity for notification appliances, 25 percent spare capacity for initiating devices. Annotate data for each circuit on the drawings.

Amplifiers; G

Data to indicate that the amplifiers have sufficient capacity to simultaneously drive all notification speakers at the maximum rating plus 50 percent spare capacity. Annotate data for each circuit on the drawings.

As-Built Drawings

Six sets of detailed as-built drawings. Furnish one set of full size paper as-built drawings and schematics. The drawings shall be prepared on uniform sized mylar sheets not less than 30 by 42 inches with 8 by 4 inch title block similar to contract drawings. Furnish one set of CD or DVD discs containing software back-up and CAD based drawings in latest version of AutoCadd and DXF format of as-built drawings and schematics. The drawings shall include complete wiring diagrams showing connections between devices and equipment, both factory and field wired. Include a riser diagram and drawings showing the as-built location of devices and equipment. The drawings shall show the system as installed, including deviations from both the project drawings and the approved shop drawings. These drawings shall be submitted within two weeks after the final acceptance test of the system. At least one set of as-built (marked-up) drawings shall be provided at the time of, or prior to the final acceptance test.

SD-03 Product Data

UL or FM listing cards for equipment provided.

Technical Data And Computer Software; G
Fire alarm control panel (FACP); G
Fire Alarm And Mass Notification Control Panel (FACP/FMCP); G
Terminal cabinets/assemblies; G
Manual stations; G
Transmitters (including housing); G
Batteries; G
Battery chargers; G
Smoke sensors; G
Thermal sensors; G
Wiring and cable; G
Notification appliances; G
Addressable interface devices; G
Amplifiers; G
Tone generators; G
Digitalized voice generators; G
Waterflow detectors; G
Tamper switches; G
Remote fire alarm control units; G
Digital alarm communicator transmitter (DACT); G

SD-05 Design Data

System Operation; G

A complete description of the system operation in matrix format on the drawings.

Battery power; G

Battery calculations as required in paragraph Battery Power Calculations.

SD-06 Test Reports

Field Quality Control
Testing Procedures; G
Smoke sensor testing procedures; G

SD-07 Certificates

Installer

SD-09 Manufacturer's Field Reports

Mass Notification System

A unique identifier for each device, including the control panel and initiating and indicating devices, with an indication of test results, and signature of the factory-trained technician of the control panel manufacturer and equipment installer. With reports on preliminary tests, include printer information. Include the NFPA 72 Record of Completion and NFPA 72 Inspection and Testing Form, with the appropriate test reports.

SD-10 Operation and Maintenance Data

Operation and Maintenance (O&M) Instructions; G

Six copies of the Operation and Maintenance Instructions, indexed and in booklet form. The Operation and Maintenance Instructions shall be a single volume or in separate volumes, and may be submitted as a Technical Data Package. Manuals shall be approved prior to training.

Original and backup copies of all software delivered for this project, on each type of CD/DVD media utilized.

Instruction of Government Employees

The installers training history for the employees involved with this contract.

1.6 QUALITY ASSURANCE

Equipment and devices shall be compatible and operable with existing Edwards EST3 fire alarm system and Fireworks Graphic Control Workstation and shall not impair reliability or operational functions of existing supervising station fire alarm system. The Fireworks Graphic Control Workstation is located in building S-200 Guard House. The supervising equipment is existing and consists of the following brands and models: supervising station control system Edwards Fireworks Graphic Control Workstation with MN-COM1S network interface devices, and MN-FVPN VOIP network modules.

- a. In NFPA publications referred to herein, consider advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears; interpret reference to "authority having jurisdiction" to mean the Contracting Offices Designated Representative (COR).

- b. The recommended practices stated in the manufacturer's literature or documentation shall be considered as mandatory requirements.

1.6.1 Qualifications

1.6.1.1 Design Services

Installations requiring completion of installation drawings and specification or modifications of fire detection, fire alarm, mass notification system, fire suppression systems or mass notification systems shall require the services and review of a qualified engineer or a NICET Level 4 Fire Alarm Technician.

1.6.1.2 Supervisor

The installing Contractor shall provide the following: NICET Fire Alarm Technicians to perform the installation of the system. A NICET Level 3 Fire Alarm Technician shall supervise the installation of the fire alarm system/mass notification system or a Fire Alarm Technician with a minimum of 8 years of experience shall perform/supervise the installation of the fire alarm system/mass notification system. The Fire Alarm technicians supervising the installation of equipment shall be factory trained in the installation, adjustment, testing, and operation of the equipment specified herein and on the drawings.

1.6.1.3 Technician

The installing Contractor shall provide the following: Fire Alarm Technicians with a minimum of four years of experience utilized to assist in the installation and terminate fire alarm/mass notification devices, cabinets and panels. The Fire Alarm technicians installing the equipment shall be factory trained in the installation, adjustment, testing, and operation of the equipment specified herein and on the drawings.

1.6.1.4 Installer

The installing Contractor shall provide the following: Fire Alarm installer with a minimum of two years of experience utilized to assist in the installation of fire alarm/mass notification devices, cabinets and panels. An electrician shall be allowed to install wire or cable and to install conduit for the fire alarm system/mass notification system. The Fire Alarm installer shall be factory trained in the installation, adjustment, testing, and operation of the equipment specified herein and on the drawings.

1.6.1.5 Testing

The installing Contractor shall provide the following: Fire Alarm Technicians with a minimum of eight years of experience utilized to test and certify the installation of the fire alarm/mass notification devices, cabinets and panels. The Fire Alarm technicians testing the equipment shall be factory trained in the installation, adjustment, testing, and operation of the equipment specified herein and on the drawings. After the installing Contractor has finished all tests, the Contractor shall employ an independent, third party testing agency to test the system.

1.6.1.6 Manufacturer's Representative

The fire alarm and mass notification equipment manufacturer's representative shall be present for the connection of wiring to the control panel. The Manufacturer's Representative shall be an employee of the manufacturer with necessary technical training on the system being installed.

1.6.1.7 Manufacturer

Components shall be of current design and shall be in regular and recurrent production at the time of installation. Provide design, materials, and devices for a protected premises fire alarm system, complete, conforming to NFPA 72, except as otherwise or additionally specified herein.

1.6.2 Regulatory Requirements

1.6.2.1 Requirements for Fire Protection Service

Equipment and material shall have been tested by UL and listed in UL Fire Prot Dir or approved by FM and listed in FM APP GUIDE. Where the terms "listed" or "approved" appear in this specification, they shall mean listed in UL Fire Prot Dir or FM APP GUIDE. The omission of these terms under the description of any item of equipment described shall not be construed as waiving this requirement. All listings or approval by testing laboratories shall be from an existing ANSI or UL published standard.

1.6.2.2 Mass Notification System

The equipment furnished shall be compatible and be UL listed, FM approved, or approved or listed by a nationally recognized testing laboratory for the intended use. All listings or approval by testing laboratories shall be from an existing ANSI or UL published standard.

1.6.2.3 Testing Services or Laboratories

Fire alarm and fire detection equipment shall be constructed in accordance with UL Fire Prot Dir, UL Electrical Constructn, or FM APP GUIDE.

1.7 DELIVERY, STORAGE, AND HANDLING

Protect equipment delivered and placed in storage from the weather, humidity, and temperature variation, dirt and dust, and other contaminants.

1.8 OPERATION AND MAINTENANCE (O&M) INSTRUCTIONS

The Interior Fire Alarm and Mass Notification System Operation and Maintenance Instructions shall include:

- a. "Manufacturer Data Package 5" as specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA.
- b. Operating manual outlining step-by-step procedures required for system startup, operation, and shutdown. The manual shall include the manufacturer's name, model number, service manual, parts list, and complete description of equipment and their basic operating features.

- c. Maintenance manual listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guide. The manuals shall include conduit layout, equipment layout and simplified wiring, and control diagrams of the system as installed.
- d. The manuals shall include complete procedures for system revision and expansion, detailing both equipment and software requirements.
- e. Software delivered for this project shall be provided, on each type of CD/DVD media utilized.
- f. Printouts of configuration settings for all devices.
- g. Routine maintenance checklist. The routine maintenance checklist shall be arranged in a columnar format. The first column shall list all installed devices, the second column shall state the maintenance activity or state no maintenance required, the third column shall state the frequency of the maintenance activity, and the fourth column for additional comments or reference.

1.9 EXTRA MATERIALS

1.9.1 Repair Service/Replacement Parts

Repair services and replacement parts for the system shall be available for a period of 10 years after the date of final acceptance of this work by the Contracting Officer. During guarantee period, the service technician shall be on-site within 24 hours after notification. All repairs shall be completed within 24 hours of arrival on-site.

1.9.2 Interchangeable Parts

Spare parts furnished shall be directly interchangeable with the corresponding components of the installed system. Spare parts shall be suitably packaged and identified by nameplate, tagging, or stamping. Spare parts shall be delivered to the Contracting Officer at the time of the final acceptance testing.

1.9.3 Spare Parts

Furnish the following spare parts and accessories:

- a. Four fuses for each fused circuit
- b. Nine spare reams of paper for the system printer, plus sufficient paper for fire alarm acceptance tests
- c. Three spare printer ribbons
- d. Three break rods for manual stations

1.9.4 Special Tools

Software, connecting cables and proprietary equipment, necessary for the maintenance, testing, and reprogramming of the equipment shall be furnished to the Contracting Officer.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 Standard Products

Provide materials, equipment, and devices that have been tested by a nationally recognized testing laboratory, such as UL or FM, and listed or approved for fire protection service when so required by NFPA 72 or this specification. Select material from one manufacturer, where possible, and not a combination of manufacturers, for any particular classification of materials. Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products for at least two years prior to bid opening.

2.1.2 Nameplates

Major components of equipment shall have the manufacturer's name, address, type or style, model or serial number, catalog number, date of installation, installing Contractor's name and address, and the contract number provided on a new plate permanently affixed to the item or equipment. Major components include, but are not limited to, the following:

- a. FACPs
- b. Printer

Furnish nameplates to obtain approval by the Contracting Officer before installation. Obtain approval by the Contracting Officer for installation locations. Nameplates shall be etched metal or plastic, permanently attached by screws to panels or adjacent walls.

2.2 GENERAL PRODUCT REQUIREMENT

All fire alarm and mass notification equipment shall be listed for use under the applicable reference standards. Interfacing of Listed UL 864 or similar approved industry listing with Mass Notification Panels listed to UL 2017 or equal shall be done in a laboratory listed configuration, if the software programming features cannot provide a listed interface control.

2.3 SYSTEM OPERATION

The Addressable Interior Fire Alarm and Mass Notification System shall be a complete, supervised, noncoded, analog/addressable fire alarm and mass notification system conforming to NFPA 72, UL 864 Ninth Edition, and UL 2017. The system shall be activated into the alarm mode by actuation of any alarm initiating device. The system shall remain in the alarm mode until the initiating device is reset and the fire alarm control panel is reset and restored to normal. The system may be placed in the alert mode by local microphones or remotely from authorized locations/users. The system shall be fully compatible with the existing campus Fireworks software package.

Provide module in the control panel to send fire information through the network to the existing Fireworks Control Center.

Provide a VOIP module so that the control panel can accept voice announcements through the network from the other MNS equipment on the campus.

Provide two Cat 6 cables from the control panel to the Owner's network switch in the building.

2.3.1 Alarm Initiating Devices

Connect alarm initiating devices to initiating device circuits (IDC), Style B to signal line circuits (SLC), Style 6 and installed in accordance with NFPA 72.

- a. Alarm notification appliances shall be connected to notification appliance circuits (NAC) and Voice Notification System, as "Class A" in accordance with NFPA 72. A looped conduit system shall be provided so that if the conduit and all conductors within are severed or exposed to fire at any point, all IDC, NAC and SLC will remain functional. Should the design or building layout preclude separation then a fire rated separation shall be provided in accordance with NFPA 72. The return portion of the loop shall be remote from the supply portion of the loop.
- b. Any single impairment of the system shall not affect the system on more than one of any floor.
- c. The system shall operate in the alarm mode upon actuation of any alarm initiating device. The system shall remain in the alarm mode until initiating device(s) are reset and the fire alarm control panel is manually reset and restored to normal. The conduit loop requirement is not applicable to the signal transmission link from the local panels (at the protected premises) to the Supervising Station (fire station, fire alarm central communication center). Audible, and visual appliances and systems shall comply with NFPA 72. Fire alarm system/mass notification system components requiring power, except for the control panel power supply, shall operate on 24 Volts dc.

2.3.2 Functions and Operating Features

The system shall provide the following functions and operating features:

- a. The FACP/FMCP and fire alarm and mass notification control units, if used, shall provide power, annunciation, supervision, and control for the system. Addressable systems shall be microcomputer (microprocessor or microcontroller) based with a minimum word size of eight bits with sufficient memory to perform as specified.
- b. Provide Style B initiating device circuits for conductor lengths of **10 feet** or less.
- c. Provide Style 6 signaling line circuits for each floor.
- d. Provide Style Class A notification appliance circuits. The visual alarm notification appliances shall have the flash rates synchronized.
- e. Provide electrical supervision of the primary power (AC) supply, presence of the battery, battery voltage, and placement of system modules within the control panel.
- f. Provide an audible and visual trouble signal to activate upon a single break or open condition, or ground fault. The trouble signal shall also operate upon loss of primary power (AC) supply, absence of a battery supply, low battery voltage, or removal of alarm or supervisory panel

modules. Provide a trouble alarm silence feature that shall silence the audible trouble signal, without affecting the visual indicator. After the system returns to normal operating conditions, the trouble signal shall again sound until the trouble is acknowledged. A smoke sensor in the process of being verified for the actual presence of smoke shall not initiate a trouble condition.

g. Provide a notification appliance silencing switch, that when activated, will silence the audible signal appliance, but will not affect the visual alarm indicator, the liquid crystal display, or the automatic notification of the central station service. This switch shall be overridden upon activation of a subsequent alarm.

h. Provide alarm verification capability for smoke sensors. Alarm verification shall initially be set for 30 seconds.

i. Provide program capability via switches in a locked portion of the FACP to bypass the automatic notification appliance circuits, fire reporting system, air handler shutdown, smoke control operation, and elevator recall features. Operation of this programming shall indicate this action on the FACP display and printer output.

j. Alarm, supervisory, and/or trouble signals shall be automatically transmitted to the central station.

k. Alarm functions shall override trouble or supervisory functions. Supervisory functions shall override trouble functions.

l. The system shall be capable of operating, supervising, and/or monitoring both addressable and non-addressable alarm and supervisory devices.

m. There shall be no limit, other than maximum system capacity, as to the number of addressable devices, that may be in alarm simultaneously.

n. Where the fire alarm system is responsible for initiating an action in another emergency control device or system, such as an HVAC system or an elevator system, the addressable fire alarm relay shall be within **3 feet** of the emergency control device.

o. An alarm signal shall automatically initiate the following functions:

- (1) Transmission of an alarm signal to the UL listed central station.
- (2) Visual indication of the device operated on the fire alarm control panel (FACP).
- (3) Continuous actuation of all alarm notification appliances, except those in stairs or in elevator cabs.
- (4) Recording of the event via the system printer and electronically in the history log of the fire control system unit.
- (5) Operation of a smoke sensor in an elevator lobby or other location associated with the automatic recall of elevators, shall recall the elevators in addition to other requirements of this paragraph.

(6) Operation of a duct smoke sensor shall shut down the appropriate air handler in accordance with NFPA 90A in addition to other requirements of this paragraph.

(7) Operation of a sprinkler waterflow switch serving an elevator machinery room or elevator shaft shall operate shunt trip circuit breaker(s) to shut down power to the elevators in accordance with ASME A17.1/CSA B44.

p. A supervisory signal shall automatically initiate the following functions:

(1) Visual indication of the device operated on the FACP, and sound the audible alarm at the respective panel.

(2) Transmission of a supervisory signal to the central station.

(3) Recording of the event via the system printer and electronically in the history log of the fire control system unit.

q. A trouble condition shall automatically initiate the following functions:

(1) Visual indication of the system trouble on the FACP, and sound the audible alarm at the respective panel.

(2) Transmission of a trouble signal to the central station.

(3) Recording of the event via the system printer.

r. The maximum permissible elapsed time between the actuation of an initiating device and its indication at the FACP shall be 10 seconds.

s. The maximum elapsed time between the occurrence of the trouble condition and its indication at the FACP shall not exceed 200 seconds.

2.4 SYSTEM MONITORING

2.4.1 Valves

Each valve affecting the proper operation of a fire protection system, including automatic sprinkler control valves, standpipe control valves, sprinkler service entrance valve, valves at fire pumps, isolating valves for pressure type waterflow or supervision switches, and valves at backflow preventers, whether supplied under this contract or existing, shall be electrically monitored to ensure its proper position. Each tamper switch shall be provided with a separate address, unless they are within the same room, then a maximum of five can use the same address.

2.4.2 Independent Fire Detection System

Each existing independent smoke detection subsystem, and kitchen fire extinguishing system shall be monitored both for the presence of an alarm condition and for a trouble condition. Each monitored condition shall be provided with a separate address.

2.5 MASS NOTIFICATION SYSTEM FUNCTIONS

2.5.1 Notification Appliance Network

The notification appliance network consists of audio speakers located to provide intelligible instructions at all locations in the building. The Mass Notification System announcements shall take priority over all other function of the system including the audible and visual output of the fire alarm system in a normal or alarm state. All fire alarm system functions shall continue in an alarm state except for the output signals of the audible and visual notification appliances.

2.5.2 Strobes

Strobes are also provided to alert hearing-impaired occupants.

2.5.3 Text Displays

LED text displays for hearing impaired occupants if applicable and shown.

2.5.4 Giant Voice

The Giant Voice system (if available) in the area of the building shall be activated to provide a pre-recorded message.

2.5.5 Voice Notification

An autonomous voice notification control unit is used to monitor and control the notification appliance network and provide consoles for local operation. Using a console, personnel in the building can initiate delivery of pre-recorded voice messages, provide live voice messages and instructions, and initiate visual strobe and (optional) textual message notification appliances. The autonomous voice notification control unit will temporarily override audible fire alarm notification while delivering Mass Notification messages to ensure they are intelligible.

2.5.6 Base-Wide Control

The base-wide control system for mass notification exists on the base at the Guard House building S-200. The building FACP/MNS control unit shall communicate with the Fireworks Graphic Control Workstation unit base-wide system. The FACP/MNS control unit shall receive commands/messages from the central control unit and provide status information.

2.6 OVERVOLTAGE AND SURGE PROTECTION

2.6.1 Signaling Line Circuit Surge Protection

For systems having circuits located outdoors, communications equipment shall be protected against surges induced on any signaling line circuit and shall comply with the applicable requirements of IEEE C62.41.1 and IEEE C62.41.2. Cables and conductors, that serve as communications links, shall have surge protection circuits installed at each end that meet the following waveform(s):

- a. A 10 microsecond by 1000 microsecond waveform with a peak voltage of 1500 volts and a peak current of 60 amperes.

- b. An 8 microsecond by 20 microsecond waveform with a peak voltage of 1000 volts and a peak current of 500 amperes. Protection shall be provided at the equipment. Additional triple electrode gas surge protectors, rated for the application, shall be installed on each wireline circuit within 3 feet of the building cable entrance. Fuses shall not be used for surge protection.

2.6.2 Sensor Wiring Surge Protection

Digital and analog inputs and outputs shall be protected against surges induced by sensor wiring installed outdoors. The inputs and outputs shall be tested with the following waveforms:

- a. A 10 by 1000 microsecond waveform with a peak voltage of 1500 volts and a peak current of 60 amperes.
- b. An 8 by 20 microsecond waveform with a peak voltage of 1000 volts and a peak current of 500 amperes. Fuses shall not be used for surge protection.

2.7 ADDRESSABLE INTERFACE DEVICES

The initiating device being monitored shall be configured as a Style D initiating device circuits. The system shall be capable of defining any module as an alarm module and report alarm trouble, loss of polling, or as a supervisory module, and reporting supervisory short, supervisory open or loss of polling such as waterflow switches, valve supervisory switches, fire pump monitoring, independent smoke detection systems, relays for output function actuation, etc. The module shall be UL or FM listed as compatible with the control panel. The monitor module shall provide address setting means compatible with the control panel's SLC supervision and store an internal identifying code. Monitor module shall contain an integral LED that flashes each time the monitor module is polled. Pull stations with a monitor module in a common backbox are not required to have an LED.

2.8 ADDRESSABLE CONTROL MODULE

The control module shall be capable of operating as a relay (dry contact form C) for interfacing the control panel with other systems, and to control door holders or initiate elevator fire service. The module shall be UL or FM listed as compatible with the control panel. The indicating device or the external load being controlled shall be configured as a Style Y notification appliance circuit. The system shall be capable of supervising audible, visual and dry contact circuits. The control module shall have both an input and output address. The supervision shall detect a short on the supervised circuit and shall prevent power from being applied to the circuit. The control model shall provide address setting means compatible with the control panel's SLC supervision and store an internal identifying code. The control module shall contain an integral LED that flashes each time the control module is polled. Control Modules shall be located in environmental areas that reflect the conditions to which they were listed.

2.9 SMOKE SENSORS

2.9.1 Photoelectric Smoke Sensors

Provide addressable photoelectric smoke sensors as follows:

- a. Provide analog/addressable photoelectric smoke sensors utilizing the photoelectric light scattering principle for operation in accordance with UL 268. Smoke sensors shall be listed for use with the fire alarm control panel.
- b. Provide self-restoring type sensors that do not require any readjustment after actuation at the FACP to restore them to normal operation. Sensors shall be UL listed as smoke-automatic fire sensors.
- c. Components shall be rust and corrosion resistant. Vibration shall have no effect on the sensor's operation. Protect the detection chamber with a fine mesh metallic screen that prevents the entrance of insects or airborne materials. The screen shall not inhibit the movement of smoke particles into the chamber.
- d. Provide twist lock bases for the sensors. The sensors shall maintain contact with their bases without the use of springs. Provide companion mounting base with screw terminals for each conductor. Terminate field wiring on the screw terminals. The sensor shall have a visual indicator to show actuation.
- e. The sensor address shall identify the particular unit, its location within the system, and its sensitivity setting. Sensors shall be of the low voltage type rated for use on a 24 VDC system.
- f. An operator at the control panel, having a proper access level, shall have the capability to manually access the following information for each initiating device.
 - (1) Primary status
 - (2) Device type
 - (3) Present average value
 - (4) Present sensitivity selected
 - (5) Sensor range (normal, dirty, etc.)

2.9.2 Duct Smoke Sensors

Duct-mounted photoelectric smoke detectors shall be furnished and installed where indicated and in accordance with NFPA 90A. Units shall consist of a smoke detector as specified in paragraph Photoelectric Detectors, mounted in a special housing fitted with duct sampling tubes. Detector circuitry shall be mounted in a metallic enclosure exterior to the duct. Detectors shall have a manual reset. Detectors shall be rated for the air velocities of the ducts in which they are installed. Detectors shall be powered from the fire alarm panel.

- a. Sampling tubes shall run the full width of the duct. The duct detector package shall conform to the requirements of NFPA 90A, UL 268A, and shall be UL listed for use in air-handling systems. The control functions, operation, reset, and bypass shall be controlled from the fire alarm control panel.
- b. Lights to indicate the operation and alarm condition; and the test and reset buttons shall be visible and accessible with the unit installed and the cover in place. Detectors mounted above 6

feet and those mounted below 6 feet that cannot be easily accessed while standing on the floor, shall be provided with a remote detector indicator panel containing test and reset switches.

c. Remote lamps and switches as well as the affected fan units shall be properly identified in etched plastic placards. Detectors shall provide for control of auxiliary contacts that provide control, interlock, and shutdown functions. Auxiliary contacts provide for this function shall be located within 3 feet of the controlled circuit or appliance. The detectors shall be supplied by the fire alarm system manufacturer to ensure complete system compatibility.

2.9.3 Smoke Sensor Testing

Smoke sensors shall be tested in accordance with NFPA 72 and manufacturer's recommended calibrated test method. Submit smoke sensor testing procedures for approval.

2.10 THERMAL SENSORS

2.10.1 Heat Detectors

Heat detectors shall be designed for detection of fire by combination fixed temperature and rate-of-rise principle. The alarm condition shall be determined by comparing sensor value with the stored values. Heat detector spacing shall be rated in accordance with UL 521. Detectors located in areas subject to moisture, exterior atmospheric conditions, or hazardous locations as defined by NFPA 70, shall be types approved for such locations.

2.10.1.1 Combination Fixed-Temperature and Rate-of-Rise Detectors

Detectors shall be designed for semi-flush outlet box mounting (or surface outlet box mounting where no ceilings are being installed) and supported independently of wiring connections. Contacts shall be self-resetting after response to rate-of-rise principle. Under fixed temperature actuation, the detector shall have a permanent external indication that is readily visible. Detector units located in boiler rooms, showers, or other areas subject to abnormal temperature changes shall operate on fixed temperature principle only. The UL 521 test rating for the fixed temperature portion shall be 135 degrees F. The UL 521 test rating for the Rate-of-Rise detectors shall be rated for 50 by 50 feet.

2.10.2 Self-Test Routines

Automatic self-test routines shall be performed on each sensor that will functionally check sensor sensitivity electronics and ensure the accuracy of the value being transmitted. Any sensor that fails this test shall indicate a trouble condition with the sensor location at the control panel.

2.10.3 Operator Access

An operator at the control panel, having the proper access level, shall have the capability to manually access the following information for each heat sensor:

- a. Primary status
- b. Device type
- c. Present average value

d. Sensor range

2.10.4 Operator Control

An operator at the control panel, having the proper access level, shall have the capability to manually control the following information for each heat sensor:

- a. Alarm detection sensitivity values
- b. Enable or disable the point/device
- c. Control sensors relay driver output

2.11 ELECTRIC POWER

2.11.1 Primary Power

Power shall be 120 VAC service for the FACP from the emergency AC service to the building.

2.11.2 Generator

Where any emergency generator provides a standby power supply for life safety system circuits, provide a connection from one of the circuits for the fire alarm system. When a generator buss circuit is available for the fire alarm, mass notification, and life safety equipment, then the fire alarm control unit shall monitor the generator with the following supervisory signals:

- (a) Generator Selector Switch in a position other than automatic start
- (b) Generator Running
- (c) Low Fuel
- (d) Failure to Start
- (e) Abnormal conditions such as low oil, high temperature, and low coolant.
- (f) Low Battery
- (g) Emergency transfer in proper mode while generator running

2.12 EMERGENCY POWER SUPPLY

Provide for system operation in the event of primary power source failure. Transfer from normal to auxiliary (secondary) power or restoration from auxiliary to normal power shall be automatic and shall not cause transmission of a false alarm.

2.12.1 Batteries

Provide sealed, maintenance-free, lead-calcium, sealed lead acid or gel cell batteries as the source for emergency power to the FACP. Batteries shall contain suspended electrolyte. The battery system shall be maintained in a fully charged condition by means of a solid state battery charger. Provide an automatic transfer switch to transfer the load to the batteries in the event of the failure of primary power.

2.12.1.1 Capacity

Provide the batteries with sufficient capacity to operate the system under supervisory and trouble conditions, including audible trouble signal devices for 4 hours and audible and visual signal devices under alarm conditions for an additional 15 minutes.

2.12.1.2 Battery Power Calculations

- a. Verify that battery capacity exceeds supervisory and alarm power requirements.
 - 1). Substantiate the battery calculations for alarm, alert, and supervisory power requirements. Ampere-hour requirements for each system component and each panel component, and the battery-recharging period shall be included.
 - 2). Provide complete battery calculations for both the alarm, alert, and supervisory power requirements. Ampere-hour requirements for each system component shall be submitted with the calculations.
 - 3). A voltage drop calculation to indicate that sufficient voltage is available for proper operation of the system and all components, at the minimum rated voltage of the system operating on batteries.
- b. For battery calculations use the following assumptions: Assume a starting voltage of 24 VDC for starting the calculations to size the batteries. Calculate the required Amp-Hours for the specified standby time, and then calculate the required Amp-Hours for the specified alarm time. Calculate the nominal battery voltage after operation on batteries for the specified time period. Using this voltage perform a voltage drop calculation for circuit containing device and/or appliances remote from the power sources.

2.12.2 Battery Chargers

Provide a solid state, fully automatic, variable charging rate battery charger. The charger shall be capable of providing 150 percent of the connected system load and shall maintain the batteries at full charge. In the event the batteries are fully discharged (18 Volts dc), the charger shall recharge the batteries back to 95 percent of full charge within 48 hours.

2.13 FIRE ALARM AND MASS NOTIFICATION CONTROL PANEL (FACP/FMCP)

Provide a complete control panel fully enclosed in a lockable steel enclosure as specified herein. Operations required for testing or for normal care and maintenance of the systems shall be performed from the front of the enclosure. If more than a single unit is required at a location to form a complete control panel, the unit enclosures shall match exactly. The FACP/FMCP shall be an Edward EST3 or approved equal.

- a. Each control unit shall provide power, supervision, control, and logic for the entire system, utilizing solid state, modular components, internally mounted and arranged for easy access. Each control unit shall be suitable for operation on a 120 volt, 60 hertz, normal building power supply. Provide each panel with supervisory functions for power failure, internal component placement, and operation.

b. Visual indication of alarm, supervisory, or trouble initiation on the fire alarm control panel shall be by liquid crystal display or similar means with a minimum of 80 characters, that at least 32 are field changeable. The MNS Control panel shall have the capability of temporarily deactivate the fire alarm audible notification appliances while delivering voice messages. Provide conductor integrity monitoring for strobe, display, temporary deactivation of fire alarm audible notification appliances and speaker wiring.

c. Provide secure operator console for initiating recorded messages, strobes and displays; and for delivering live voice messages. Provide capacity for at least four pre-recorded messages. Provide the ability to automatically repeat pre-recorded messages. Provide a secure microphone for delivering live messages. Provide adequate discrete outputs to temporarily deactivate fire alarm audible notification, and initiate/synchronize strobes. Provide a complete set of self-diagnostics for controller and appliance network. Provide local diagnostic information display and local diagnostic information and system event log file.

d. Provide a switch labeled "HVAC System Emergency Shutdown". It shall have normally open contacts that, when closed, signal the Energy Management System to Shutdown all heating, ventilating, and air conditioning units.

2.13.1 Cabinet

Install control panel components in cabinets large enough to accommodate all components and also to allow ample gutter space for interconnection of panels as well as field wiring. The enclosure shall be identified by an engraved laminated phenolic resin nameplate. Lettering on the nameplate shall say "Fire Alarm and Mass Notification Control Panel" and shall not be less than one inch high. Provide prominent rigid plastic or metal identification plates for lamps, circuits, meters, fuses, and switches. The cabinet shall be provided in a sturdy steel housing, complete with back box, hinged steel door with cylinder lock, and surface mounting provisions.

2.13.2 Control Modules

Provide power and control modules to perform all functions of the FACP. Provide audible signals to indicate any alarm, supervisory, or trouble condition. The alarm signals shall be different from the trouble signal. Connect circuit conductors entering or leaving the panel to screw-type terminals with each terminal marked for identification. Locate diodes and relays, if any, on screw terminals in the FACP. Circuits operating at 24 VDC shall not operate at less than 21.6 volts. Circuits operating at any other voltage shall not have a voltage drop exceeding 10 percent of nominal voltage.

2.13.3 Silencing Switches

a. Alarm Silencing Switch: Provide an alarm silencing switch at the FACP that shall silence the audible signal but not affect the visual alarm indicator. This switch shall be overridden upon activation of a subsequent alarm.

b. Supervisory/Trouble Silencing Switch: Provide supervisory and trouble silencing switch that shall silence the audible trouble and supervisory signal, but not extinguish the visual indicator. This switch shall be overridden upon activation of a subsequent alarm, supervision, or trouble condition. Audible trouble indication must resound automatically every 24 hours after the silencing feature has been operated.

2.13.4 Non-Interfering

Power and supervise each circuit such that a signal from one device does not prevent the receipt of signals from any other device. Circuits shall be manually reset by switch from the FACP after the initiating device or devices have been restored to normal.

2.13.5 Voice Notification System

The Voice Notification System shall comply with the requirements of NFPA 72 for Emergency Voice/Alarm Communications System requirements ISO 7240-16, IEC 60268-16, except as specified herein. The system shall be a one-way multi-channel voice notification system incorporating user selectability of a minimum 8 distinct sounds for tone signaling, and the incorporation of a voice module for delivery of prerecorded messages. Textual audible appliances shall produce a slow whoop tone for three cycles followed by a voice message that is repeated until the control panel is reset or silenced. Automatic messages shall be broadcast through speakers on all floors, but not in stairs or elevator cabs. The visual strobes and audible message shall automatically be broadcast on all floors. A live voice message shall override the automatic audible output through use of a microphone input at the control panel.

a. When using the microphone, live messages shall be broadcast through speakers in stairs, in elevator cabs, and throughout a selected floor or floors. The system shall be capable of operating all speakers at the same time. The Voice Notification System shall support Public Address (PA) paging for the facility. The digitalized voice message shall consist of a non-volatile (EPROM) microprocessor based input to the amplifiers. The microprocessor shall actively interrogate circuitry, field wiring, and digital coding necessary for the immediate and accurate rebroadcasting of the stored voice data into the appropriate amplifier input. Loss of operating power, supervisory power, or any other malfunction that could render the digitalized voice module inoperative shall automatically cause the slow whoop tone to take over all functions assigned to the failed unit.

b. The Mass Notification functions shall override the manual or automatic fire alarm notification or Public Address (PA) functions. The system shall have the capability of utilizing a remote microphone station with redundant controls of the notification system control panel. Class "A" Notification Appliance Circuits (NAC) shall be provided for the activation of strobe appliances. The activation of the NAC Circuits shall follow the operation of the speaker NAC circuits. Audio output shall be selectable for line level (600 ohms), 25, 70.7 or 100 volt output. The audio amplifier outputs shall be not greater than 95 watts RMS output. The strobe NAC Circuits shall provide at least 2 amps of 24 VDC power to operate strobes and have the ability to synchronize all strobes. A hand held microphone shall be provided and, upon activation, shall take priority over any tone signal, recorded message or PA microphone operation in progress, while maintaining the strobe NAC Circuits activation.

All outputs and operational modules shall be fully supervised with on-board diagnostics and trouble reporting circuits. Form "C" contacts shall be provided for system alarm and trouble conditions. Circuits shall be provided for operation of auxiliary appliance during trouble conditions. During a Mass Notification event the panel shall not generate nor cause any trouble alarms to be generated with the Fire Alarm system. Mass Notification functions shall take precedence over all other function performed by the Voice Notification System. Messages shall utilize a male voice and shall be similar to the following:

- 1) 1000 Hz tones (1 sec on, 1/2 second off, 1 second on, 1/2 second off, 1 second on)

"May I have your attention, please. May I have your attention, please. A fire has been reported that may affect your floor. Please walk to the nearest exit and evacuate the building." (Provide a 2 second pause.) "May I have your attention, please, (repeat the message)."

- 2) 1000 Hz tones (1 sec on, 1/2 second off, 1 second on, 1/2 second off, 1 second on)

"May I have your attention please. May I have your attention please. A fire emergency has been reported in the building. Please leave the building by the nearest exit or exit stairway. Do not use the elevators." (Provide a 2 second pause.) "May I have your attention please, (repeat the message)."

- 3) 1000 Hz tones (1 sec on, 1/2 second off, 1 second on, 1/2 second off, 1 second on)

"Alert! This is the Mass Notification System.
There is an emergency situation.
DO NOT evacuate the building! Stay in your current location!
Stay tuned for further instructions."
(repeat message 2 times)

- 4) 1000 Hz tones (1 sec on, 1/2 second off, 1 second on, 1/2 second off, 1 second on)

"Alert, This is the Mass Notification System.
There is a chemical gas emergency.
Turn off all HVAC equipment, seal all doors and windows with wet fabric, Don protective gear.
DO NOT evacuate the building, Act now!
Listen to the MNS system for further instructions".
(repeat message 2 times)

- 5) 1000 Hz tones (1 sec on, 1/2 second off, 1 second on, 1/2 second off, 1 second on)

"Alert, this is the Mass Notification System.
There is an explosive blast risk along the South wall of your building.
Quietly move towards the north side of the building, and exit from the north stairs.
Move away from the building heading north to the north parking area.
(repeat message 2 times).

a. The Remote Microphone station shall incorporate a Push-To-Talk (PTT) microphone, redundant controls and system status indicators of/for the system. The unit shall incorporate microphone override of any tone generation or prerecorded messages. The unit shall be fully supervised from the control panel. The housing shall contain a lock that is keyed identical to the fire alarm system for the building.

b. Remote Microphone station (PA) shall incorporate a Push-To-Talk (PTT) microphone, and controls to allow Public Address paging in the facility. The Public Address paging function shall not override any alarm or notification functions. The microphone shall be handheld style.

2.13.6 Memory

Provide each control unit with non-volatile memory and logic for all functions. The use of long life batteries, capacitors, or other age-dependent devices shall not be considered as equal to non-volatile processors, PROMS, or EPROMS.

2.13.7 Field Programmability

Provide control units and control panels that are fully field programmable for control, initiation, notification, supervisory, and trouble functions of both input and output. The system program configuration shall be menu driven. System changes shall be password protected and shall be accomplished using personal computer based equipment. Any proprietary equipment and proprietary software needed by qualified technicians to implement future changes to the fire alarm system shall be provided as part of this contract.

2.13.8 Input/Output Modifications

The FACP shall contain features that allow the bypassing of input devices from the system or the modification of system outputs. These control features shall consist of a panel mounted keypad and a keyboard. Any bypass or modification to the system shall indicate a trouble condition on the FACP, VDU and a printed output of the trouble condition.

2.13.9 Resetting

Provide the necessary controls to prevent the resetting of any alarm, supervisory, or trouble signal while the alarm, supervisory or trouble condition on the system still exists.

2.13.10 Instructions

Provide a typeset printed or typewritten instruction card mounted behind a Lexan plastic or glass cover in a stainless steel or aluminum frame and install the frame in a conspicuous location observable from the FACP. The card shall show those steps to be taken by an operator when a signal is received as well as the functional operation of the system under all conditions, normal, alarm, supervisory, and trouble. The instructions shall be approved by the Contracting Officer before being posted.

2.13.11 Walk Test

The FACP shall have a walk test feature. When using this feature, operation of initiating devices shall result in limited system outputs, so that the notification appliances operate for only a few seconds and the event is indicated on the system printer, but no other outputs occur.

2.13.12 History Logging

In addition to the required printer output, the control panel shall have the ability to store a minimum of 400 events in a log. These events shall be stored in a battery-protected memory and shall remain in the memory until the memory is downloaded or cleared manually. Resetting of the control panel shall not clear the memory.

2.13.13 RS-232-C Output

Each local control panel shall be capable of operating remote service type cathode ray tubes (CRTs), printers, and/or modems. The output shall be paralleled ASCII from an EIA RS-232-C connection with a baud rate of 1200 or 2400 to allow use of any commonly available CRT, printer, or modem. The output shall be used to connect network interface device, model MN-COM1S, for communications to Fireworks Graphic Control Workstation in guard house.

2.13.14 Remote LED Text Display

An LED text display shall be provided at locations as shown on the drawings. The LED text display shall be at least 2 lines with a minimum of 20 characters per line. The size shall not exceed 16 inches length by 6 inches height by 3 inches deep. The text display shall as a minimum meet the following requirements:

- a. Two lines of information for high priority messaging.
- b. Minimum of 20 characters per line (40 total) displayed.
- c. Text shall be no less than 1/2 inch in height and readable from 1 foot to 20 feet away.
- d. 32K character memory.
- e. RS232 or RS485 serial interface included.
- f. Display shall be wall or ceiling mounted.
- g. Mounting brackets for a convenient wall/cubicle mount.
- h. During non-emergency periods, date and time shall be displayed.
- i. All programming shall be accomplished from the Mass Notification network. No user programming shall be required.

An LED text display shall be provided at locations as shown on the drawings. The LED text display shall have minimum character size of 4-inches high and shall spell out the words "EVACUATE" and "ANNOUNCEMENT". The design of LED text display shall be such that it cannot be read when not illuminated. The LED text display shall be capable of being wall or ceiling mounted.

2.14 REMOTE FIRE ALARM CONTROL UNITS

Provide complete remote control units fully enclosed in a lockable steel enclosure as specified herein. Operations required for testing or for normal care and maintenance of the control units shall be performed from the front of the enclosure. If more than a single unit is required at a location to form a complete control panel, the unit enclosures shall match exactly. Each control unit shall provide power, supervision, control, and logic for its portion of the entire system, utilizing solid state, modular components, internally mounted and arranged for easy access. Each control unit shall be suitable for operation on a 120 volt, 60 hertz, normal building power supply. Provide each unit with supervisory functions for power failure, internal component placement, and operation.

2.14.1 Cabinet

Install remote control unit components in cabinets large enough to accommodate components and also to allow ample gutter space for interconnection of units as well as field wiring. The enclosure shall be identified by an engraved laminated phenolic resin nameplate. Lettering on the nameplate shall be labeled "Remote Fire Alarm Control Unit" and shall not be less than one inch high. Provide prominent rigid plastic or metal identification plates for lamps, circuits, meters, fuses, and switches. The cabinet shall be provided in a sturdy steel housing, complete with back box, hinged steel door with cylinder lock, and surface mounting provisions.

2.14.2 Control Modules

Provide power and control modules to perform all functions of the remote control unit. Provide audible signals to indicate any alarm or trouble condition. The alarm signals shall be different from the trouble signal. Connect circuit conductors entering or leaving the panel to screw-type terminals with each terminal marked for identification. Locate diodes and relays, if any, on screw terminals in the remote control unit. Circuits operating at 24 VDC shall not operate at less than 21.6 volts. Circuits operating at any other voltage shall not have a voltage drop exceeding 10 percent of nominal voltage. Circuits shall be arranged so that there is 25 percent spare capacity for any circuit.

2.14.3 Silencing Switches

Provide an alarm silencing switch at the remote control unit that shall silence the audible signal but not affect the visual alarm indicator. This switch shall be overridden upon activation of a subsequent alarm. Provide trouble and supervisory silencing switch that shall silence the audible trouble and supervisory signal, but not extinguish the visual indicator. This switch shall be overridden upon activation of a subsequent trouble or supervisory signal. Audible trouble indication must resound automatically every 24 hours after the silencing feature has been operated.

2.14.4 Non-Interfering

Power and supervise each circuit such that a signal from one device does not prevent the receipt of signals from any other device. Circuits shall be manually resettable by switch from the remote control unit after the initiating device or devices have been restored to normal.

2.14.5 Memory

Provide each control unit with non-volatile memory and logic for all functions. The use of long life batteries, capacitors, or other age-dependent devices shall not be considered as equal to non-volatile processors, PROMS, or EPROMS.

2.14.6 Field Programmability

Provide control units that are fully field programmable for control, initiating, supervisory, and trouble functions of both input and output. The system program configuration shall be menu driven. System changes shall be password protected and shall be accomplished using personal computer based equipment. Any proprietary equipment and proprietary software needed by qualified technicians to implement future changes to the fire alarm system shall be provided as part of this contract.

2.14.7 Input/Output Modifications

Each remote control unit shall contain features that allow the elimination of input devices from the system or the modification of system outputs. Any such modifications shall indicate a trouble condition on the remote control unit, the FACP, and a printed output of the trouble condition.

2.14.8 Resetting

Provide the necessary controls to prevent the resetting of any alarm, supervisory, or trouble signal while the alarm, supervisory, or trouble condition on the system still exists.

2.14.9 Instructions

Provide a typeset printed or typewritten instruction card mounted behind a Lexan plastic or glass cover in a stainless steel or aluminum frame. Install the frame in a conspicuous location observable from the remote fire alarm control unit. Install the frame in a conspicuous location observable from the remote fire alarm control unit. The card shall show those steps to be taken by an operator when a signal is received as well as the functional operation of the system under all conditions, normal, alarm, supervisory, and trouble. The instructions shall be approved by the Contracting Officer before being posted.

2.14.10 Walk Test

Each remote control unit shall have a walk test feature. When using this feature, operation of initiating devices shall result in limited system outputs, so that the notification appliances operate for only a few seconds and the event is indicated on the system printer, but no other outputs occur.

2.14.11 History Logging

In addition to the required printer output, the control panel shall have the ability to store a minimum of 400 events in a log. These events shall be stored in a battery-protected memory and shall remain in the memory until the memory is downloaded or cleared manually. Resetting of the control panel shall not clear the memory.

2.15 AMPLIFIERS, PREAMPLIFIERS, TONE GENERATORS

Any amplifiers, preamplifiers, tone generators, digitalized voice generators, and other hardware necessary for a complete, operational, textual audible circuit conforming to NFPA 72 shall be housed in a fire alarm control unit, terminal cabinet, or in the fire alarm control panel. The system shall automatically operate and control all building fire alarm speakers except those installed in the stairs and within elevator cabs. The speakers in the stairs and elevator cabs shall operate only when the microphone is used to deliver live messages. Each amplifier shall be single output channel.

2.15.1 Construction

Amplifiers shall utilize computer grade solid state components and shall be provided with output protection devices sufficient to protect the amplifier against any transient up to 10 times the highest rated voltage in the system.

2.15.2 Inputs

Each system shall be equipped with separate inputs from the tone generator, digitalized voice driver and panel mounted microphone. Microphone inputs shall be of the low impedance, balanced line type. Both microphone and tone generator input shall be operational on any amplifier.

2.15.3 Tone Generator

The tone generator shall be of the modular, plug-in type with securely attached labels to identify the component as a tone generator and to identify the specific tone it produces. The tone generator shall produce a slow whoop tone, that shall slowly ascend from low (500 hertz) to high (1200 hertz), and shall be constantly repeated until interrupted by either the digitalized voice message, the microphone input, or the alarm silence mode as specified. Each slow whoop cycle shall last approximately 4 seconds. The tone generator shall be single channel with an automatic backup generator per channel such that failure of the primary tone generator causes the backup generator to automatically take over the functions of the failed unit and also causes transfer of the common trouble relay.

2.15.4 Protection Circuits

Each amplifier shall be constantly supervised for any condition that could render the amplifier inoperable at its maximum output. Failure of any component shall cause automatic transfer to a designated backup amplifier, illumination of a visual "amplifier trouble" indicator on the control panel, appropriate logging of the condition on the system printer, and other actions for trouble conditions as specified.

2.16 SYSTEM PRINTERS

- a. Provide a system printer to record alarm, supervisory, and trouble conditions without loss of any signal or signals. Printout shall be by circuit, device, and function as provided in the FACP. Printer shall operate on a 120 VAC, 60 Hz power supply. The printer shall have at least 80 characters per line and have a 96 ASCII character set. The printer shall have a microprocessor-controlled, bi-directional, logic seeking head capable of printing 120 characters per second. Printer shall not contain internal software that is essential for proper operation.
- b. When the FACP receives a signal, the alarm, supervisory, and trouble condition shall be printed. The printout shall include the type of signal, the circuit or device reporting, the date, and the time of the occurrence. The printer shall differentiate alarm signals from other printed indications. When the system is reset, this condition shall also be printed including the same information concerning device, location, date, and time. Provide a means to automatically print a list of existing alarm, supervisory, and trouble conditions in the system. If a printer is off-line when an alarm is received, the system shall have a buffer to retain the data and it shall be printed when the printer is restored to service. The printer shall have an indicator to alert the operator that the paper has run out.

2.17 MANUAL STATIONS

Provide metal, semi-flush mounted, single action, addressable manual stations, that are not subject to operation by jarring or vibration. Stations shall be equipped with screw terminals for each conductor. Stations that require the replacement of any portion of the device after activation are not permitted. Stations shall be finished in fire-engine red with molded raised lettering operating instructions of

contrasting color. The use of a key or wrench shall be required to reset the station. Manual stations shall be mounted at 48 inches. Stations shall have a separate screw terminal for each conductor. Coordinate with precast contractor for boxes to be cast into walls.

2.18 NOTIFICATION APPLIANCES

2.18.1 Fire Alarm/Mass Notification Speakers

Audible appliances shall conform to the applicable requirements of UL 464. Appliances shall be connected into notification appliance circuits. Audible appliances shall generate a unique audible sound from other devices provided in the building and surrounding area. Surface mounted audible appliances shall be painted red. Recessed audible appliances shall be installed with a grill that is painted red.

a. Speakers shall conform to the applicable requirements of UL 1480. Speakers shall have six different sound output levels and operate with audio line input levels of 100 Vac, 70 Vac, 7 Vac, and 25 Vac, by means of selectable tap settings. Tap settings shall include taps of 1/4, 1/2, 1, and 2 watt. Speakers shall incorporate a high efficiency speaker for maximum output at minimum power across a frequency range of 400Hz to 4000Hz, and shall have a sealed back construction. Speakers shall be capable of installation on standard 4 inch square electrical boxes. Where speakers and strobes are provided in the same location, they may be combined into a single unit. All inputs shall be polarized for compatibility with standard reverse polarity supervision of circuit wiring via the Fire Alarm Control Panel and Voice Notification System.

b. Provide speaker mounting plates constructed of cold rolled steel having a minimum thickness of 16 gauge and equipped with mounting holes and other openings as needed for a complete installation. Fabrication marks and holes shall be ground and finished to provide a smooth and neat appearance for each plate. Each plate shall be primed and painted.

2.19.2 Visual Notification Appliances

Visual notification appliances shall conform to the applicable requirements of UL 1971 and conform to the Americans With Disabilities Act (ADA). Colored lens such as amber, the notifications appliances shall comply with UL 1638. The manufacturer shall have the color lens tests to the full UL 1971 polar plotting criteria, voltage drop, and temperature rise as stated in 1971. Fire Alarm Notification Appliances shall have clear high intensity optic lens, xenon flash tubes, and output white light and be marked "Fire" in red letters. Mass Notification Appliances shall have amber high intensity optic lens, xenon flash tubes, and output white light and be marked "ALERT" in red letters. The light pattern shall be disbursed so that it is visible above and below the strobe and from a 90 degree angle on both sides of the strobe. Strobe flash rate shall be 1 flash per second and a minimum of 75 candela (actual output after derating for tinted lens) based on the UL 1971 test. Strobe shall be semi-flush mounted. Coordinate box mounting with Contractor for precast installation. Where more than two appliances are located in the same room or corridor, provide synchronized operation.

2.19.3 Connections

Provide screw terminals for each notification appliance. Terminals shall be designed to accept the size conductors used in this project without modification.

2.20 ENVIRONMENTAL ENCLOSURES OR GUARDS

Environmental enclosures shall be provided to permit Fire Alarm or Mass Notification components to be used in areas that exceed the environmental limits of the listing. The enclosure shall be listed for the device or appliance as either a manufactured part number or as a listed compatible accessory for the UL category that the component is currently listed. Guards required to deter mechanical damage shall be either a listed manufactured part or a listed accessory for the category of the initiating device or notification appliance.

2.21 INTERFACE TO THE BASE WIDE MASS NOTIFICATION NETWORK

2.21.1 Sending and Receiving Signals

The system shall be equipped with a COM1S module that sends fire information to through the Owner's network to the Fireworks Control Center.

The system shall be equipped with a VOIP module that allows voice announcements to be sent through the network to the EST3 control panel.

Provide two Cat 6 cables from the EST3 control panel to the Owner's existing switch.

2.21.2 Digital Alarm Communicator Transmitter (DACT)

Provide DACT that is compatible with the existing supervising station fire alarm system. Transmitter shall have a means to transmit alarm, supervisory, and trouble conditions via a single transmitter. Transmitter shall have a source of power for operation that conforms to NFPA 72. Transmitter shall be capable of initiating a test signal daily at any selected time. Transmitter shall be arranged to seize telephone circuits in accordance with NFPA 72.

2.21.3 Signals to Be Transmitted to the Base Receiving Station

The following signals shall be sent to the base receiving station:

- a. Sprinkler water flow
- b. Manual pull stations
- c. Smoke detectors
- d. Duct smoke detectors
- e. Sleeping room smoke detectors
- f. Heat detectors
- g. Fire Extinguishing System
- h. Sprinkler valve supervision
- i. Fire pump running

- j. Fire pump supervision
- k. Water supply level and temperature
- l. Combustion Engine Drive Fire Pump Running
 - (1) Selector Switch in position than automatic
 - (2) Engine Over-speed
 - (3) Low Fuel
 - (4) Low Battery
 - (5) Engine Trouble (Low Oil, Over temp, etc)

2.25 WIRING

Provide wiring materials under this section as specified in Section 26 05 19, LOW-VOLTAGE POWER CONDUCTORS AND CABLES and Section 26 05 33, RACEWAYS, OUTLET BOXES, AND JUNCTION BOXES FOR ELECTRICAL SYSTEMS with the additions and modifications specified herein.

2.25.1 Alarm Wiring

The SLC wiring shall be copper cable in accordance with the manufacturers requirements. Copper signaling line circuits and initiating device circuit field wiring shall be No. 16 AWG size conductors at a minimum. Notification appliance circuit conductors, that contain audible alarm devices, other than speakers, shall be solid copper No. 14 AWG size conductors at a minimum. Speaker circuits shall be copper No. 16 AWG size conductors at a minimum. Firefighter telephone circuits shall be No. 16 AWG size conductors as a minimum. Wire size shall be sufficient to prevent voltage drop problems. Circuits operating at 24 VDC shall not operate at less than 21.6 volts. Circuits operating at any other voltage shall not have a voltage drop exceeding 10 percent of nominal voltage. Power wiring, operating at 120 VAC minimum, shall be a minimum No. 12 AWG solid copper having similar insulation.

PART 3 EXECUTION

3.1 INSTALLATION OF FIRE ALARM INITIATING AND INDICATING DEVICES

- a. FACP/FMCP: Locate the FACP/FMCP where indicated on the drawings. Surface mount the enclosure with the top of the cabinet 6 feet above the finished floor or center the cabinet at 5 feet, whichever is lower. Conductor terminations shall be labeled and a drawing containing conductors, their labels, their circuits, and their interconnection shall be permanently mounted in the FACP.
- b. Manual Stations: Locate manual stations as required by NFPA 101IEC 60268, Part 16, and ASA S3.2 and NFPA 72 and where shown on the drawings. Mount stations so that their

operating handles are 4 feet above the finished floor. Mount stations so they are located no farther than 5 feet from the exit door they serve, measured horizontally.

c. Notification Appliance Devices: Locate notification appliance devices as required by NFPA 72 and where shown on the drawings. Mount assemblies on walls 90 inches above the finished floor or 6 inches below the ceiling whichever is lower. Ceiling mounted speakers shall conform to NFPA 72.

d. Smoke and Heat Sensors: Locate sensors as required by NFPA 72 and their listings and as shown on the drawings on a 4 inch mounting box. Sensors located on the ceiling shall be installed not less than 4 inches from a side wall to the near edge. Those located on the wall shall have the top of the sensor at least 4 inches below the ceiling, but not more than 12 inches below the ceiling. In raised floor spaces, the smoke sensors shall be installed to protect 225 square feet per sensor. Install smoke sensors no closer than 5 feet from air handling supply outlets.

e. Water Flow Detectors and Tamper Switches: Locate water flow detectors and tamper switches where shown on the drawings and at each sprinkler valve station. Devices as provided by the Sprinkler contractor and monitoring device within 3 feet by this Contractor.

f. Firefighter Telephones: Locate wall mounted in each stair at each floor landing, in each elevator lobby, and in each elevator cab 4 feet above the finished floor. Furnish outlets as shown on the drawings.

h. The modification of any fire alarm system and the procedures shall comply with the requirements of NFPA 241.

3.2 SYSTEM FIELD WIRING

3.2.1 Wiring within Cabinets, Enclosures, and Boxes

Provide wiring installed in a neat and workmanlike manner and installed parallel with or at right angles to the sides and back of any box, enclosure, or cabinet. Conductors that are terminated, spliced, or otherwise interrupted in any enclosure, cabinet, mounting, or junction box shall be connected to terminal blocks. Mark each terminal in accordance with the wiring diagrams of the system. Make connections with approved pressure type terminal blocks, that are securely mounted. The use of wire nuts or similar devices shall be prohibited. Wiring shall conform to NFPA 70.

3.2.2 Terminal Cabinets

Provide a terminal cabinet at the base of any circuit riser, on each floor at each riser, and where indicated on the drawings. Terminal size shall be appropriate for the size of the wiring to be connected. Conductor terminations shall be labeled and a drawing containing conductors, their labels, their circuits, and their interconnection shall be permanently mounted in the terminal cabinet. Minimum size is 8 inches by 8 inches.

3.2.3 Alarm Wiring

Provide all wiring in rigid metal conduit or intermediate metal conduit. Voltages shall not be mixed in any junction box, housing, or device, except those containing power supplies and control relays. Electrical metallic tubing conduit is acceptable in dry locations not enclosed in concrete or where not

subject to mechanical damage. Conceal conduit in finished areas of new construction and wherever practicable in existing construction. The use of flexible conduit not exceeding a 6 foot length shall be permitted in initiating device circuits. Run conduit or tubing concealed unless specifically shown otherwise on the drawings. Shielded wiring shall be utilized where recommended by the manufacturer. For shielded wiring, the shield shall be grounded at only one point, that shall be in or adjacent to the FACP. Pigtail or T-tap connections to signal line circuits, initiating device circuits, supervisory alarm circuits, and notification appliance circuits are prohibited. Color coding is required for circuits and shall be maintained throughout the circuit. Conductors used for the same functions shall be similarly color coded. Wiring shall conform to NFPA 70.

3.2.4 Conductor Terminations

Labeling of conductors at terminal blocks in terminal cabinets, FACP, and remote fire alarm control units shall be provided at each conductor connection. Each conductor or cable shall have a shrink-wrap label to provide a unique and specific designation. Each terminal cabinet, FACP, and fire alarm control unit shall contain a laminated drawing that indicates each conductor, its label, circuit, and terminal. The laminated drawing shall be neat, using 12 point lettering minimum size, and mounted within each cabinet, panel, or unit so that it does not interfere with the wiring or terminals. Maintain existing color code scheme where connecting to existing equipment.

3.3 CONNECTION OF NEW SYSTEM

The following new system connections shall be made during the last phase of construction, at the beginning of the preliminary tests. New system connections shall include:

- a. Connection of new elevator recall smoke sensors to existing wiring and conduit.

Once these connections are made, system shall be left energized and new audio/visual devices deactivated. Report immediately to the Contracting Officer, coordination and field problems resulting from the connection of the above components.

3.4 FIRESTOPPING

Provide firestopping for holes at conduit penetrations through floor slabs, fire rated walls, partitions with fire rated doors, corridor walls, and vertical service shafts in accordance with Section 07 84 00 FIRESTOPPING.

3.5 PAINTING

Paint exposed electrical, fire alarm conduit, and surface metal raceway to match adjacent finishes in exposed areas. Paint junction boxes and conduit red in unfinished areas. Painting shall comply with Section 09 90 00 PAINTS AND COATINGS.

3.6 FIELD QUALITY CONTROL

3.6.1 Testing Procedures

Detailed test procedures, prepared and signed by a Registered Professional Engineer or a NICET Level 4 Fire Alarm Technician, and signed by representative of the installing company, for the fire detection and alarm system 60 days prior to performing system tests. Detailed test procedures shall list all

components of the installed system such as initiating devices and circuits, notification appliances and circuits, signaling line devices and circuits, control devices/equipment, batteries, transmitting and receiving equipment, power sources/supply, annunciators, special hazard equipment, emergency communication equipment, interface equipment, Guard's Tour equipment, and transient (surge) suppressors. Test procedures shall include sequence of testing, time estimate for each test, and sample test data forms. The test data forms shall be in a check-off format (pass/fail with space to add applicable test data) and shall be used for the preliminary testing and the acceptance testing. The test data forms shall record the test results and shall:

- a. Identify the NFPA Class and Style of all Initiating Device Circuits (IDC), Notification Appliance Circuits (NAC), Voice Notification System, and Signaling Line Circuits (SLC).
- b. Identify each test required by NFPA 72 Test Methods and required test herein to be performed on each component, and describe how this test shall be performed.
- c. Identify each component and circuit as to type, location within the facility, and unique identity within the installed system. Provide necessary floor plan sheets showing each component location, test location, and alphanumeric identity.
- d. Identify all test equipment and personnel required to perform each test (including equipment necessary for testing smoke detectors using real smoke).
- e. Provide space to identify the date and time of each test. Provide space to identify the names and signatures of the individuals conducting and witnessing each test.

3.6.2 Tests Stages

- a. Preliminary Testing: Conduct preliminary tests to ensure that devices and circuits are functioning properly. Tests shall meet the requirements of paragraph entitled "Minimum System Tests." After preliminary testing is complete, provide a letter certifying that the installation is complete and fully operable. The letter shall state that each initiating and indicating device was tested in place and functioned properly. The letter shall also state that panel functions were tested and operated properly. The letter shall include the names and titles of the witnesses to the preliminary tests. The Contractor and an authorized representative from each supplier of equipment shall be in attendance at the preliminary testing to make necessary adjustments.
- b. Request for Formal Inspection and Tests: When tests have been completed and corrections made, submit a signed, dated certificate with a request for formal inspection and tests to the Contracting Offices Designated Representative (COR).
- c. Final Testing: Notify the Contracting Officer in writing when the system is ready for final acceptance testing. Submit request for test at least 15 calendar days prior to the test date. The tests shall be performed in accordance with the approved test procedures in the presence of the Contracting Officer. Furnish instruments and personnel required for the tests. A final acceptance test will not be scheduled until the operation and maintenance (O&M) manuals are furnished to the Contracting Officer and the following are provided at the job site:

- (1) The systems manufacturer's technical representative
- (2) Marked-up red line drawings of the system as actually installed

- (3) Megger test results
- (4) Loop resistance test results
- (5) Complete program printout including input/output addresses

The final tests shall be the third party's independent testing agency and shall be witnessed by the Contracting Offices Designated Representative (COR). At this time, any and all required tests shall be repeated at their discretion. Following acceptance of the system, as-built drawings and O&M manuals shall be delivered to the Contracting Officer for review and acceptance.

3.6.3 Minimum System Tests

Test the system in accordance with the procedures outlined in NFPA 72, ISO 7240-16, IEC 60268-16. The required tests are as follows:

- a. Megger Tests: After wiring has been installed, and prior to making any connections to panels or devices, wiring shall be megger tested for insulation resistance, grounds, and/or shorts. Conductors with 300 volt rated insulation shall be tested at a minimum of 250 VDC. Conductors with 600 volt rated insulation shall be tested at a minimum of 500 VDC. The tests shall be witnessed by the Contracting Officer and test results recorded for use at the final acceptance test.
- b. Loop Resistance Tests: Measure and record the resistance of each circuit with each pair of conductors in the circuit short-circuited at the farthest point from the circuit origin. The tests shall be witnessed by the Contracting Officer and test results recorded for use at the final acceptance test.
- c. Verify the absence of unwanted voltages between circuit conductors and ground. The tests shall be accomplished at the preliminary test with results available at the final system test.
- d. Verify that the control unit is in the normal condition as detailed in the manufacturer's O&M manual.
- e. Test each initiating and indicating device and circuit for proper operation and response at the control unit. Smoke sensors shall be tested in accordance with manufacturer's recommended calibrated test method. Use of magnets is prohibited. Testing of duct smoke detectors shall comply with the requirements of NFPA 72.
- f. Test the system for specified functions in accordance with the contract drawings and specifications and the manufacturer's O&M manual.
- g. Test both primary power and secondary power. Verify, by test, the secondary power system is capable of operating the system for the time period and in the manner specified.
- h. Determine that the system is operable under trouble conditions as specified.
- i. Visually inspect wiring.
- j. Test the battery charger and batteries.

- k. Verify that software control and data files have been entered or programmed into the FACP. Hard copy records of the software shall be provided to the Contracting Officer.
- l. Verify that red-line drawings are accurate.
- m. Measure the current in circuits to ensure there is the calculated spare capacity for the circuits.
- n. Measure voltage readings for circuits to ensure that voltage drop is not excessive.
- o. Disconnect the verification feature for smoke sensors during tests to minimize the amount of smoke needed to activate the sensor. Testing of smoke sensors shall be conducted using real smoke. The use of canned smoke is prohibited.
- p. Measure the voltage drop at the most remote appliance (based on wire length) on each notification appliance circuit.
- q. Audibility Intelligibility testing of the Voice Evacuation Notification System shall be accomplished iaw NFPA 72 for Voice Evacuation Systems, IEC 60268-16, and ASA S3.2.
- r. Opening the circuit at not less than 50% of alarm initiating devices and notification appliances to test the wiring supervisory feature.
- s. Demonstrate modem communications with remote sites as specified by the COR.
- t. Demonstrate network communications with Fireworks Graphic Control Workstation.

3.7 INSTRUCTION OF GOVERNMENT EMPLOYEES

Equipment manufacturer shall provide one day of onsite technical training for government personnel.

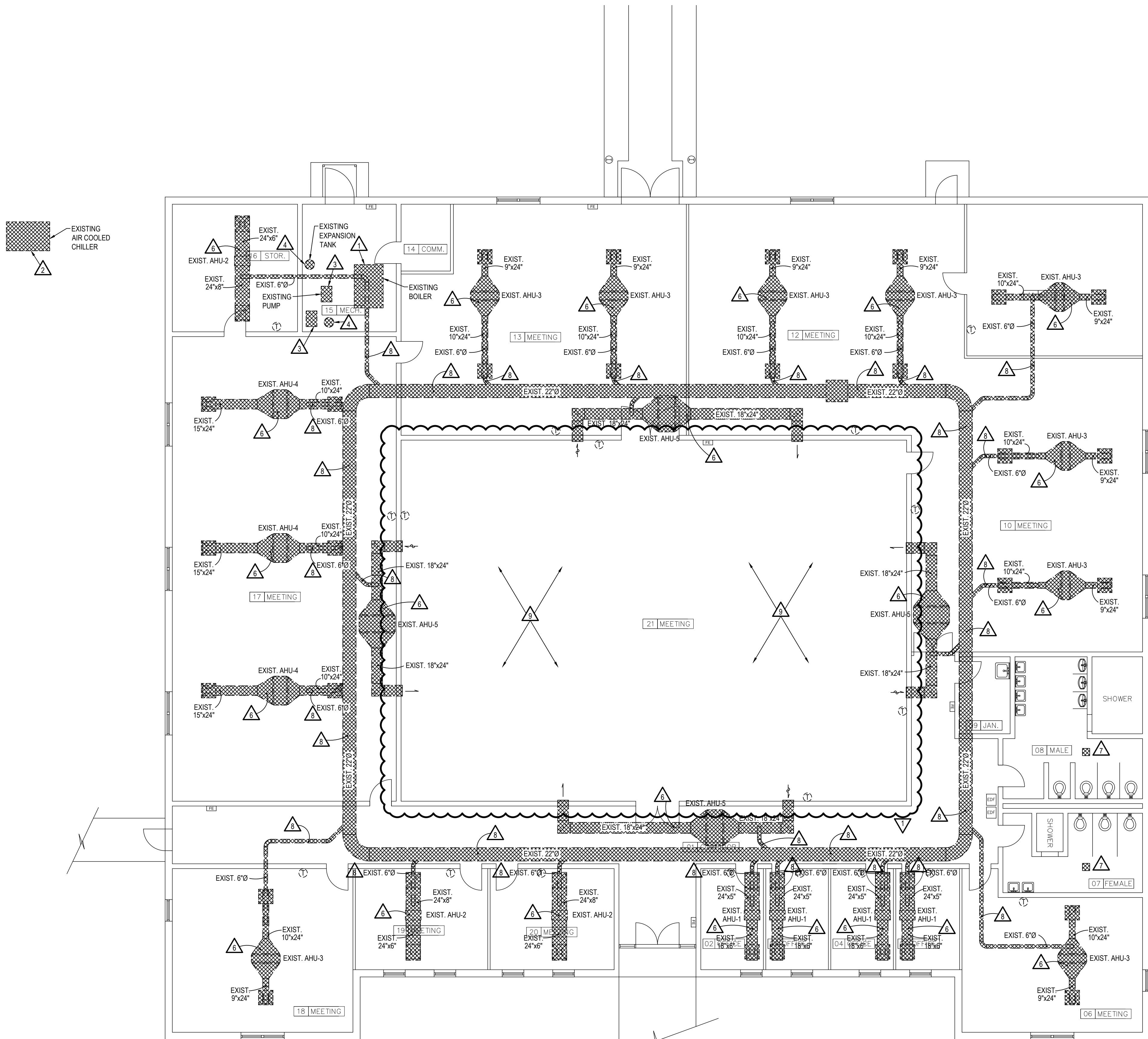
3.7.1 Required Instruction Time

Provide 8 hours of instruction after final acceptance of the system. The instruction shall be given during regular working hours on such dates and times as are selected by the Contracting Officer. The instruction may be divided into two or more periods at the discretion of the Contracting Officer. The training shall allow for rescheduling for unforeseen maintenance and/or fire department responses.

3.7.2 Technical Data and Computer Software

Provide, in manual format, lesson plans, operating instructions, maintenance procedures, and training data for the training courses. The operations training shall familiarize designated government personnel with proper operation of the installed system. The maintenance training course shall provide the designated government personnel adequate knowledge required to diagnose, repair, maintain, and expand functions inherent to the system.

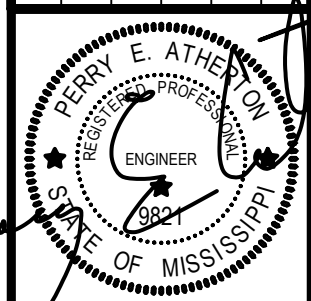
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DEMOLITION FLOOR PLAN - MECHANICAL
SCALE: 1/8" = 1'-0"

- NOTES:
- 1 REMOVE EXISTING BOILER AND ALL RELATED PIPING, CONTROLS, ELECTRICAL CONNECTION, GAS CONNECTION, ETC.
 - 2 REMOVE EXISTING CHILLER AND ALL RELATED PIPING, CONTROLS, ELECTRICAL CONNECTION, EQUIPMENT PAD, ETC. CAP ABANDONED PIPING BELOW GRADE AT CHILLER CONNECTION AND BELOW FLOOR IN MECHANICAL ROOM.
 - 3 REMOVE EXISTING PUMP AND RELATED CONTROLS, ELECTRICAL CONNECTION, PIPING, ETC.
 - 4 REMOVE EXISTING EXPANSION TANK AND RELATED PIPING, MAKE UP WATER, ETC. CAP MAKE UP WATER AT DOMESTIC WATER MAIN.
 - 5 REMOVE ALL EXISTING CHILLED/HEATING WATER PIPING AND RELATED HANGERS.
 - 6 REMOVE EXISTING AIR HANDLING UNITS, ALL RELATED SUPPLY DUCT, RETURN DUCT, CONTROLS, GRILLES, ELECTRICAL CONNECTION, PIPING CONNECTIONS, ETC. (TYPICAL FOR ALL EXISTING AHU'S)
 - 7 REMOVE EXISTING EXHAUST GRILLE AND RELATED DUCT, FAN CURB, ETC.
 - 8 REMOVE EXISTING OUTSIDE AIR DUCT AND RELATED INTAKE CAP / CURB.
 - 9 REMOVE EXISTING CEILING FAN AND ALL RELATED MOUNTING BRACKETS, CONTROLS, ELECTRICAL CONNECTIONS, ETC. (TYPICAL OF 6)

REVISIONS		DESCRIPTION	BY	TG
NO.	DATE	7-25-16	REMOVE CEILING FANS	
1				



DATE:	6/1/2016
REVISIONS:	
DRAWN BY:	TEG
CHECKED BY:	PEA

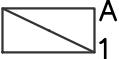
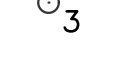
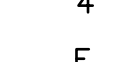
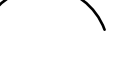
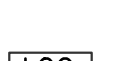
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DEMOLITION
FLOOR PLAN -
MECHANICAL

SHEET #:
MD1.0R1

MAINTENANCE and REPAIR TO BUILDING S-219
Camp McCain Training Site
Grenada, MS
PN: 28160202

ELECTRICAL LEGEND:		
	A	CEILING OUTLET: RECESSED LIGHT FIXTURE. LUMINAIRE TYPE "A", CIRCUIT #1.
	B	CEILING OUTLET: PENDANT MOUNTED 4' FLUORESCENT, TYPE "B", CIRCUIT #2.
	C	CEILING OUTLET: RECESSED DOWNLIGHT, TYPE "C", CIRCUIT #3.
	D	WALL OUTLET: WALL-MOUNTED FLUORESCENT, TYPE "D", CIRCUIT #4.
	F	CEILING OUTLET: PENDANT MOUNTED 2' FLUORESCENT, TYPE "F", CIRCUIT #5.
	X1	CEILING OUTLET: EXIT SIGN, DIRECTIONAL ARROWS AND FACING AS INDICATED.
		DENOTES FIXTURE SHALL BE EQUIPPED WITH A 90-MINUTE EMERGENCY BATTERY.
	\$	WALL SWITCH: A.C. TYPE, 1-POLE, 20A., 125/277V., MOUNTED 48" A.F.F.
	\$3	WALL SWITCH: A.C. TYPE, 3-WAY, 20A., 125/277V., MOUNTED 48" A.F.F.
		WALL OUTLET: DUPLEX RECEPTACLE, 20A., 125V., 2P., 3W., NEMA 5-20R.
		WALL OUTLET: DUPLEX RECEPTACLE, 20A., 125V., 2P., 3W., 4" ABOVE COUNTER, 2" ABOVE BACKSPASH, OR 44" A.F.F. WHERE NO COUNTER IS PRESENT.
		WALL OUTLET: SINGLE RECEPTACLE, NEMA 6-30R. MOUNT AT 18" AFF.
	J	WALL OUTLET: JUNCTION BOX FOR CONNECTION OF HARD-WIRED EQUIPMENT. COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT CONNECTION DETAILS.
	GFI	WALL OUTLET: GROUND FAULT INTERRUPTER RECEPTACLE, 20A, 125V., 2P., 3W, MOUNT AT 44" A.F.F. UNLESS OTHERWISE NOTED.
		BRANCH CIRCUIT: CONCEALED IN CEILING OR WALL.
		BRANCH CIRCUIT: HOMERUN TO PANELBOARD, CIRCUIT DESIGNATION AS NOTED. CONDUCTORS SHALL BE 2-#12, 1-#12(G) UNLESS OTHERWISE NOTED. WHEN LARGER SIZES ARE NECESSARY SIZE SHALL BE INDICATED ADJACENT TO HOMERUN OR ON EQUIPMENT SCHEDULE. GROUND CONDUCTOR IS INCLUDED IN TIC MARKS FOR CLARITY.
		BRANCH CIRCUIT: CONCEALED IN OR BELOW FLOOR OR UNDERGROUND
		COMMUNICATION OUTLET LOCATION: TWO-GANG BOX WITH ONE GANG PLASTER RING WITH 3/4"C. ROUTED OVERHEAD TO LANDLORD PROVIDED COMMUNICATIONS CONDUIT. PROVIDE PULLSTRING AND PLASTIC BUSHING AT TERMINATION LOCATION FOR CABLING BY OTHERS. MOUNTING HEIGHT SHALL BE SAME AS ADJACENT RECEPTACLE.
		EXISTING BRANCH CIRCUIT PANELBOARD.
	FACP	FIRE ALARM CONTROL PANEL. MOUNT CENTER LINE UP 60" A.F.F. ROUTE ALL FIRE ALARM HOMERUNS TO THIS LOCATION.
	MNS	MASS NOTIFICATION SYSTEM. MOUNT CENTER LINE UP 60" A.F.F. ROUTE ALL MASS NOTIFICATION HOMERUNS TO THIS LOCATION.
	LOC	MASS NOTIFICATION SYSTEM LOCAL OPERATING CONSOLE. VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH CONTRACTING OFFICER AND AUTHORITY HAVING JURISDICTION PRIOR TO ROUGH-IN.
	F	FIRE ALARM MANUAL PULL STATION.
	F15cd	FIRE ALARM AUDIBLE/VISUAL DEVICE WITH CANDELA RATING.
	S	FIRE ALARM DUCT SMOKE DETECTOR, CEILING MOUNTED.
	TSF	FIRE ALARM SPRINKLER SYSTEM TAMPER SWITCH.
	FSF	FIRE ALARM SPRINKLER SYSTEM FLOW SWITCH.
	WP	WEATHERPROOF, NEMA 3R.
	EP	EXPLOSION PROOF (SEE SPECS).
	TP	TAMPER PROOF
	RR	REMOVE AND REPLACE WITH NEW.
	EM	EMERGENCY
	EX	EXISTING
	C	CONDUIT RACEWAY
	EMT	ELECTRICAL METALLIC TUBING
	TBB	TELEPHONE BACKBOARD
	A	ABOVE COUNTER
	AFG	ABOVE FINISH GRADE
	AFF	ABOVE FINISH FLOOR
	G,GRD	GROUND
	GFI	GROUND FAULT INTERRUPTING
	AL	ALUMINUM
	CU	COPPER

NOTES:

- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL ORDINANCES AS ENFORCED BY THE AUTHORITY HAVING JURISDICTION. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.
- CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL DETAILS OF THE WORK AND ALL EXISTING FIELD CONDITIONS.
- ALL NEW CIRCUIT BREAKERS INSTALLED IN EXISTING PANELS SHALL BE FULLY COMPATIBLE WITH AND MATCH THE AIC RATING OF THE PANEL IN WHICH THEY ARE INSTALLED.
- THE ELECTRICAL CONTRACTOR SHALL CAREFULLY COORDINATE HIS WORK WITH OTHER CONTRACTORS THROUGH THE GENERAL CONTRACTOR FOR SPACE REQUIREMENTS, ETC.
- CONTRACTOR SHALL VERIFY ALL MECHANICAL EQUIPMENT NAMEPLATE DATA BEFORE ANY WORK IS DONE AND MAKE ANY ADJUSTMENTS IN BREAKER AND WIRE SIZE AS MAY BE REQUIRED.
- SHOULD THE CONTRACTOR FIND DISCREPANCIES OR OMISSIONS IN THE CONTRACT DOCUMENTS OR BE IN DOUBT AS TO INTENT, HE SHALL IMMEDIATELY OBTAIN CLARIFICATION FROM THE ARCHITECT OR ENGINEER.
- THE ELECTRICAL DRAWINGS ARE SCHEMATIC AND ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF CONDUITS, OUTLETS, ETC.. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS AND SHALL FIT HIS WORK TO CONFORM WITH THE BUILDING CONSTRUCTION, AND WITH THE OTHER TRADES.
- MOUNTING HEIGHTS OF ALL WALL OUTLETS SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED" WALL SWITCHES: 44"H. RECEPTACLES GENERAL: 18"H. TELEPHONE/DATA: 18"H. JUNCTION BOX: 18"H. EXIT LIGHT: CENTERLINE ABOVE DOOR.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT HEIGHT OF ALL COUNTER TOPS AND BACKSPASHES ON CASEWORK SHOP DRAWINGS, AND CHANGE SPECIFIED MOUNTING HEIGHT OF WALL OUTLETS INDICATED AS REQUIRED SO THAT BOTTOM OF OUTLET BOX IS 2" ABOVE TOP OF BACKSPASH OR IS NO BACKSPASH IS USED, 4" ABOVE COUNTERTOP.
- DO NOT MOUNT OUTLETS BACK-TO-BACK. PROVIDE MINIMUM 24" SEPARATION IN FIRE RATED WALLS.
- ALL OUTLETS IN EXPOSED CONCRETE BLOCK WALLS SHALL BE ADJUSTED AS REQUIRED TO ALLOW CUTTING OF ONLY ONE BLOCK. MAINTAIN UNIFORM HEIGHTS THROUGHOUT THE BUILDING.
- VERIFY ALL DOOR SWINGS WITH ARCHITECT BEFORE ROUGHING LIGHT SWITCHES.
- CONTRACTOR SHALL CHECK ALL LIGHT FIXTURES FOR EXACT TYPE MOUNTING AND SPACE REQUIRED BEFORE ROUGHING IN.
- BRANCH CIRCUITS #12 A.W.G. AND 3/4" CONDUIT (EMT) MINIMUM. CONDUCTORS SHALL BE 98% CONDUCTIVITY COPPER, THHN TYPE INSULATION. SERVICE AND FEEDER CONDUCTORS SHALL HAVE TYPE RHH INSULATION.
- VOLTAGE DROP: FOR 20 AMP CIRCUITS OVER 100FT. AND LESS THAN 175FT, USE #10 CONDUCTORS. FOR 20 AMP CIRCUITS OVER 174 FEET AND LESS THAN 275 FEET, USE #8 CONDUCTORS.
- ALL CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS.
- ALL CONDUIT INDOORS SHALL BE METALLIC, EMT WHERE EXPOSED. CONDUIT EXPOSED OUTDOORS SHALL BE IMC OR RIGID. CONDUIT UNDERGROUND SHALL BE RIGID OR PVC. PVC SHALL NOT BE EXPOSED ABOVE GRADE OR FINISH FLOOR LEVEL.
- ALL RIGID AND IMC CONDUIT SHALL BE HOT DIP GALVANIZED, INSIDE AND OUT, EMT CONDUIT SHALL BE ELECTRO GALVANIZED, CONDUIT SHALL BE AS MANUFACTURED BY REPUBLIC, WHEATLAND, ALLIED OR APPROVED EQUAL.
- ALL CIRCUIT BREAKERS SHALL BE FULLY COMPATIBLE WITH AND MATCH THE AIC RATING OF THE PANEL IN WHICH THEY ARE INSTALLED.
- ALL JUNCTION BOXES SHALL BE SUPPORTED INDEPENDENT OF CONDUIT FROM STRUCTURE ABOVE.
- SUPPORT OF RACEWAYS SHALL BE BY FACTORY MADE SUPPORTS OR HANGERS. SUPPORTS SHALL BE MADE WITH COLD-FORMED STEEL WITH CORROSION-RESISTANT COATING.
- TERMINATE ALL DEVICES SUCH THAT REMOVAL OF ONE DEVICE SHALL NOT INTERRUPT POWER TO DOWNSTREAM DEVICES. PROVIDE AT LEAST 6" SLACK CONDUCTOR AT EACH OUTLET.
- BRANCH CIRCUIT SPLICES SHALL BE MADE WITH THREADED WIRE-NUT CONNECTORS.
- CONCEAL ALL CABLES, FEEDERS, AND BRANCH CIRCUITS WHERE CEILING IS PRESENT.
- SUPPORT LIGHT FIXTURES AT ALL FOUR CORNERS AND INDEPENDENT OF CEILING GRID.
- FUSES SHALL BE TIME-DELAY, DUAL ELEMENT, UL LISTED WITH A MINIMUM INTERRUPTING RATING OF 100,000 AMPERES SYMMETRICAL. FUSES SHALL BE BUSSMAN, LITTLEFUSE, OR APPROVED EQUAL.
- CONTRACTOR SHALL PROVIDE ARC-FLASH WARNING LABELS COMPLYING WITH NEC ARTICLE 110.16 ON NEW ELECTRICAL EQUIPMENT OR EXISTING EQUIPMENT THAT IS MODIFIED.
- NEW PANELBOARDS AND EXISTING PANELBOARDS THAT ARE MODIFIED SHALL BE IDENTIFIED TO INDICATE THE DEVICE OR EQUIPMENT WHERE THE POWER SUPPLY ORIGINATES.
- ALL CONDUCTORS SHALL BE CU UNLESS OTHERWISE NOTED.
- ALL NEW ELECTRICAL TERMINATIONS AND DEVICES SHALL BE RATED FOR 75°C.
- FIRE ALARM SYSTEM SHALL BE FULLY ADDRESSABLE CLASS B. PROVIDE ALL DEVICES NECESSARY FOR A FULLY FUNCTIONAL AND CODE-COMPLIANT INSTALLATION.

LIGHTING FIXTURE SCHEDULE										
MARK	MANUFACTURER	MODEL NUMBER	LAMPS			MOUNTING		VOLTS	REMARKS	
			NO.	WATTS	TYPE	TYPE	HEIGHT			
A	LITHONIA	2TL4 40L FW A12 EZ1 LP840	1	40	LED	R	C	120	OR APPROVED EQUAL	
B	LITHONIA	ZL1D L48 5000LM FST MVOLT 40K 80CRI WH ZACVH	1	42	LED	AC	10'	120	OR APPROVED EQUAL	
C	LITHONIA	LDN6 40/10 L06 AR 120	1	18	LED	R	C	120	OR APPROVED EQUAL	
D	LITHONIA	WL4 30L EZ1 LP840	1	28.2	LED	W	AM	120	OR APPROVED EQUAL	
G	MARK LIGHTING	S4LR XXFT FL H 40 AD HT	1	12/FT	LED	R	C	120	OR APPROVED EQUAL LENGTH TO FIT	
H	LITHONIA	TWH LED 20C 1000 50K T3M MVOLT	—	72	LED	W	EX	120	OR APPROVED EQUAL	
X1/X2	LITHONIA	LQM S W 3 R 120/277 ELN SD	FURNISHED W/ UNIT			S	C	120	OR APPROVED EQUAL	
<u>LAMPS:</u> LED = LIGHT EMITTING DIODE <u>MOUNTING TYPE:</u> AC = AIRCRAFT CABLE R = RECESSED W = WALL <u>MOUNTING HEIGHT:</u> AM = CENTERED ABOVE MIRROR C = CEILING EX = EXISTING LOCATION										
<u>LIGHTING FIXTURE SCHEDULE NOTES:</u> 1. PRE-APPROVED FIXTURE MANUFACTURERS ARE LITHONIA, HUBBELL, PHILIPS/DAYBRITE, COOPER LIGHTING AND H.E. WILLIAMS. ALL OTHER MANUFACTURERS ARE SUBJECT TO A 10-DAY PRIOR APPROVAL OF SUBMITTAL. 2. ALL FIXTURES WITH SYMBOL "●" ON PLANS SHALL BE EQUIPPED WITH A BATTERY PACK. ALL FIXTURES WITH A BATTERY PACK SHALL HAVE THE BATTERY PACK INSTALLED IN THE FIXTURE AS A COMPLETE UNIT, UNLESS NOTED OTHERWISE ON THE PLANS. PROVIDE AN UN-SWITCHED HOT LEG IN ADDITION TO ANY SWITCHED HOT LEG INDICATED ON PLANS. EMERGENCY FIXTURES SHALL PRODUCE 1400 NOMINAL LUMENS. 3. ALL LAMPS SHALL BE 4000K CCT UNLESS NOTED OTHERWISE ON PLANS OR IN LIGHTING FIXTURE SCHEDULE. 4. ALL EXIT SIGNS SHALL BE UN-SWITCHED.										

GENERAL DEMOLITION NOTES:

- SEE THE MECHANICAL DEMOLITION PLAN FOR EQUIPMENT TO BE DEMOLISHED.
- IN THE AREAS SPECIFICALLY IDENTIFIED OR DESIGNATED BY THE ARCHITECTURAL DEMOLITION PLAN TO BE DEMOLISHED, DISCONNECT AND REMOVE ALL EXISTING LIGHTING FIXTURES, EXISTING SWITCHES. DISCONNECT MECHANICAL EQUIPMENT INDICATED ON MECHANICAL DEMOLITION PLAN. REMOVE ALL WIRING FROM EXISTING CONDUIT.
- MAINTAIN AND RESTORE, IF INTERRUPTED, ALL BRANCH CIRCUITS AND FEEDERS PASSING THROUGH RENOVATED AREAS AND SERVING UNDISTURBED AREAS.
- THE OWNERS ARE TO HAVE THE RIGHT-OF-FIRST-REFUSAL FOR ALL DEMOLISHED LIGHTING FIXTURES AND DEVICES.
- EXISTING LENGTHS OF STRAIGHT CONDUIT, FOUND TO BE SOUND AND RE-USABLE, MAY BE REUSED AT THE CONTRACTOR'S OPTION.
- ALL OTHER DEMOLISHED MATERIALS SHALL BE REMOVED FROM THE JOB SITE AND ARE SUBJECT TO THE DEMOLITION DIRECTIVE ISSUED BY THE ARCHITECT.
- DISPOSAL OF MATERIALS REMOVED FROM THE JOB SITE DEEMED AS HAZARDOUS INCLUDING, BUT NOT EXCLUSIVELY LIMITED TO, THE FOLLOWING: FLUORESCENT LAMPS, COMPACT FLUORESCENT LAMPS, HIGH INTENSITY DISCHARGE LAMPS AND ELECTRICAL POWER TRANSFORMERS CONTAINING P.C.B.'S SHALL BE DISPOSED OF IN COMPLIANCE WITH THE RESOURCE CONSERVATION RECOVERY ACT (R.C.R.A.), SUBTITLE "C".

ELECTRICAL LEGEND

SCALE: NTS



MAINTENANCE and REPAIR TO BUILDING S-219

Camp McCain Training Site

Grenada, MS

PN: 28160202

NO.	DATE	REVISIONS	
		DESCRIPTION	BY
▽	07/25/16	SCHEDULE & NOTE REVISIONS	



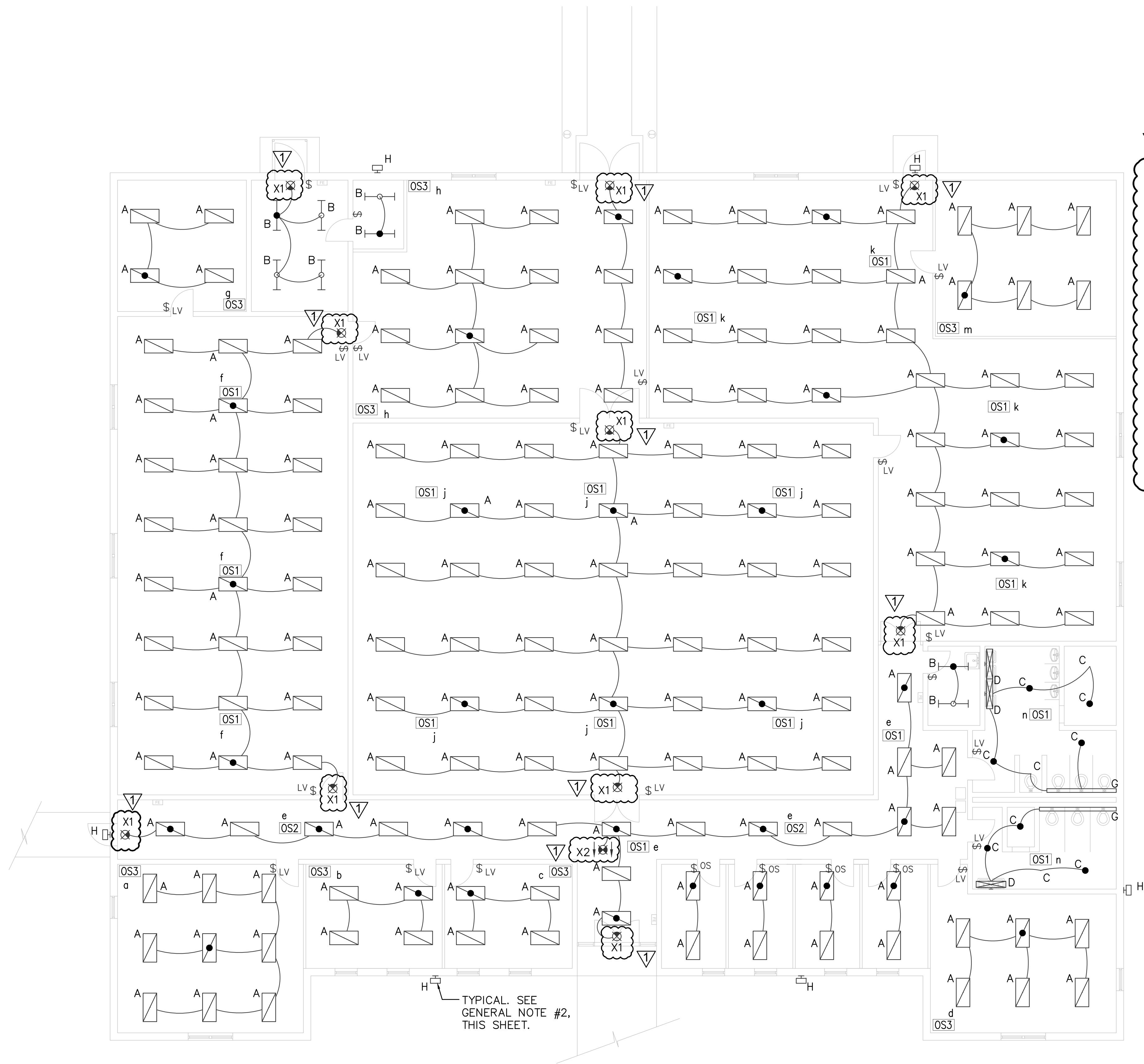
DATE: 6/01/2016	REVISIONS:	MBC	CHECKED BY: SRA
	DRAWN BY:		

201 MAIN STREET
GREENWOOD, MS 38930
[P] 662.455.2581
www.beardriser.com

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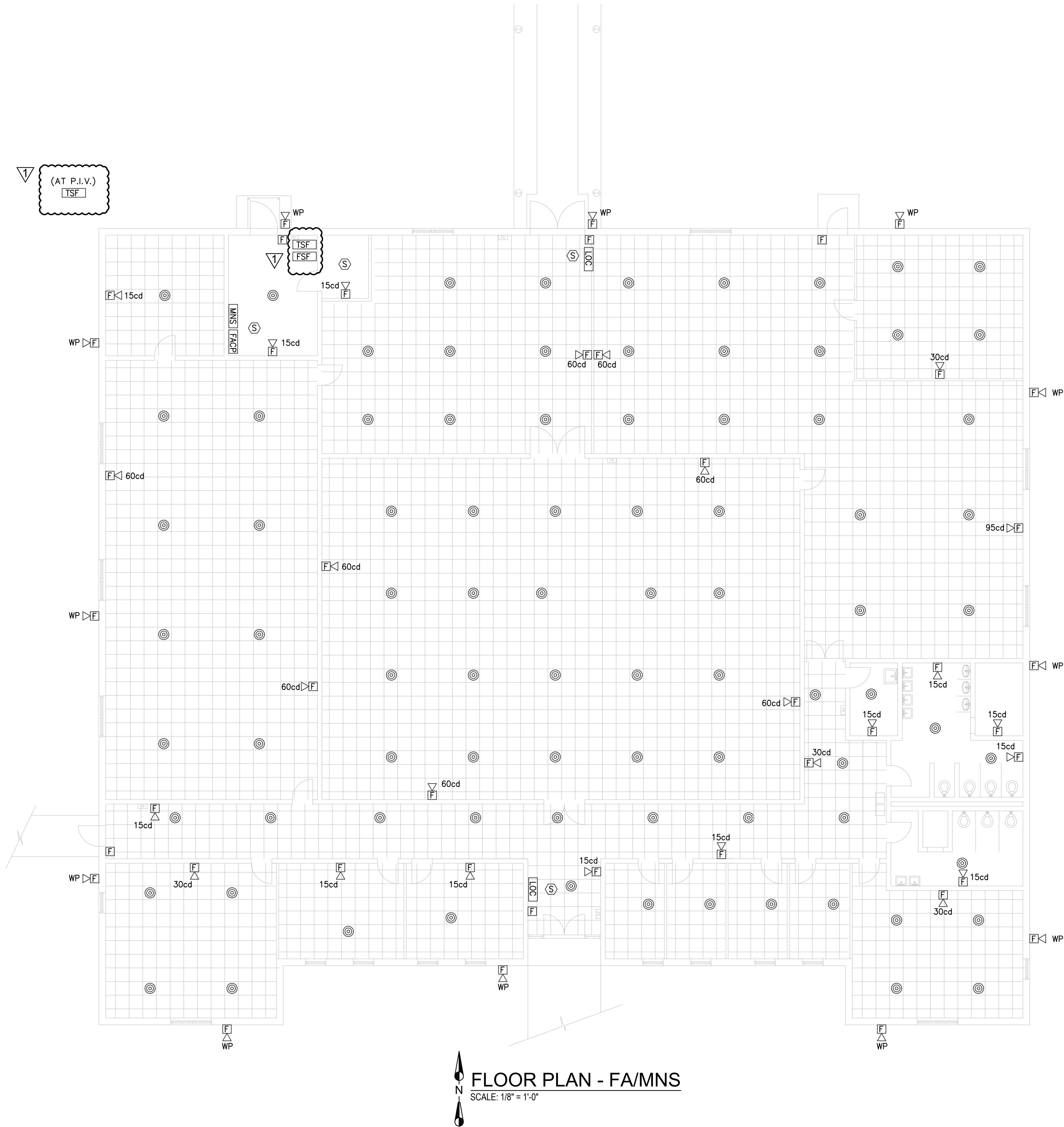
ELECTRICAL
LEGEND

SHEET #:
E1.0R



- GENERAL NOTES:**
- 1) UNDER BASE BID: INTERIOR LIGHT FIXTURES – PROVIDE NEW LED LIGHTING AS INDICATED ON PLANS.
 - 2) UNDER BASE BID: EXTERIOR LIGHT FIXTURES – DEMOLISH EXISTING LIGHT FIXTURES. OWNER HAS RIGHT-OF-FIRST-REFUSAL OF ALL DEMOLISHED LIGHT FIXTURES. REPLACE EXISTING EXTERIOR LIGHT FIXTURES WITH LED EXTERIOR FIXTURES. SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION. MAINTAIN AND RE-USE EXISTING CIRCUIT(S) AND CONTROLS. VERIFY FINISH WITH ARCHITECT PRIOR TO PURCHASE.
 - 3) DEDUCT ALTERNATE #1: IF DEDUCT ALTERNATE #1 IS TAKEN, SUPPORT EXISTING FIXTURES INDEPENDENTLY FROM CEILING GRID THAT IS TO BE REMOVED AND REPLACED. UPON REPLACEMENT OF CEILING GRID, RE-INSTALL EXISTING FIXTURES IN NEW GRID. CONTRACTOR SHALL REPLACE ANY NON-WORKING FIXTURES, OR, AT CONTRACTOR'S DISCRETION, MAY REPLACE NON-FUNCTIONING COMPONENTS. ALL FIXTURES SHALL BE FULLY FUNCTIONAL AT COMPLETION OF WORK. CONTRACTOR SHALL RE-LAMP ALL LIGHTING FIXTURES IN THE FACILITY WITH NEW LAMPS.
 - 4) CIRCUIT NEW LIGHT FIXTURES TO EXISTING CIRCUITS RESPECTIVE TO EACH ROOM.
 - 5) PROVIDE OCCUPANCY SENSORS AS NEEDED TO ACCOMMODATE THE LABELED SWITCHING FOR EACH ROOM.
 - 6) PROVIDE AN UNSWITCHED CIRCUIT TO EACH FIXTURE DESIGNATED AS EMERGENCY.

FLOOR PLAN - LIGHTING
SCALE: 1/8" = 1'-0"



1/

GENERAL NOTES:

1) ALL INTERIOR AUDIBLE/VISUAL DEVICES ((F<1)) SHALL BE STROBES ONLY, CANDELA AS INDICATED. ALL EXTERIOR DEVICES SHALL BE AUDIBLE ONLY.

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Trusted Engineering Solutions

JACKSON (601) 362-6478
www.edmondsengineering.com

Project Number :
JAN 15061

201 MAIN STREET
GREENWOOD, MS 38930
[P] 662.455.2581
www.beardriser.com

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FLOOR PLAN -
FA/MNS

SHEET #:
E2.1R

MAINTENANCE and REPAIR TO BUILDING S-219
Camp McCain Training Site
Grenada, MS
PN: 28160202

NO.	DATE	REVISIONS	DESCRIPTION	BY
1/	07/25/16		ADD TAMPER & FLOW SWITCHES	
	07/25/16		ADD INTERIOR AV NOTE	

STATE OF MISSISSIPPI
SHANE ARMOUR
Professional Engineer
No. 20238
8/1/2016

DATE: 6/01/2016
REVISIONS:
DRAWN BY: MBC
CHECKED BY: SRA