STORY CONSTRUCTION

ADDENDUM NO.2

RFB - 947400-01

IMHI Boiler #3 Replacement
Independence, Iowa

Date: January 12th, 2026

Project: 9474.00 IMHI Boiler #3 Replacement

TO: PROSPECTIVE BIDDERS:

THIS ADDENDUM FORMS A PART OF THE BIDDING AND CONTRACT DOCUMENTS AND MODIFIES THE BIDDING DOCUMENTS DATED 11-14-2025, WITH AMENDMENTS AND ADDITIONS NOTED BELOW. THIS ADDENDUM SUPERSEDES AND SUPPLEMENTS ALL PORTIONS OF THE ORIGINAL BIDDING AND CONTRACT DOCUMENTS WITH WHICH IT CONFLICTS. ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE IMPACS ELECTRONIC PROCUREMENT SYSTEM. FAILURE TO DO SO MAY DISQUALIFY THE BIDDER.

QUESTIONS AND ANSWERS

1. **What are the weight restrictions on the concrete floor?**
    a) **Per the contract documents, the contractor shall employ a structural engineer licensed in the state of Iowa to design shoring in the building for demolition and new work activities. How the boiler and other equipment is brought into the building is means and methods, we will review the shoring plan as a shop drawing.**

2. **Who is the roofing contractor carrying the warranty on the boiler house roof?**
    a) **ForSure Roofing, see attachment.**

3. **Who is providing the 90 degree stop valve for the steam inlet on the boiler (I assume this will come with the boiler)?**
    a) **This contract provides the boiler, boiler trim and auxiliaries for a complete system.**

4. **Who is supplying the control valve for the feed water system?**
    a) **This contract provides the boiler, boiler trim and auxiliaries for a complete system.**

5. **Does the gas regulator come with the boiler or is the contractor to supply? If contractor supplies, we need to know the plant gas pressure and the required boiler gas pressure?**
    a) **This contract provides the boiler, boiler trim and auxiliaries for a complete system.**
    b) **Gas Pressure is 12 psig.**

6. **Asbestos testing results.**
    a) **Please see attachment.**

7. **Does the contractor scrap the existing boiler or does the facility keep it?**
    a) **The contractor shall demolish and remove the existing boiler from site.**

8. **Conduit above ground listed to be rigid on sheet E000. Is conduit to be rigid steel, aluminum, or stainless?**
    a) **steel, RGS.**

9. **Please confirm the intent is to abandon the underground feed that is currently feeding the boiler and route new conduits feeding the new boiler above ground/overhead.**
    a) **Yes, abandon. Yes, feed overhead, support are requirement to meet code requirements.**

10. **Will the MDP be able to be temporarily shut down to perform work in regards to the new feeder?**
    a) **Coordinate with facility owner regarding expected downtime for work at MDP, including anticipated downtime duration and scheduling.**

11. **What is the Nema rating of the boiler room in regards to enclosed switches?**
    a) **NEMA 1 except for the junction boxes near the boiler. Junction boxes near the boiler to be NEMA 12.**

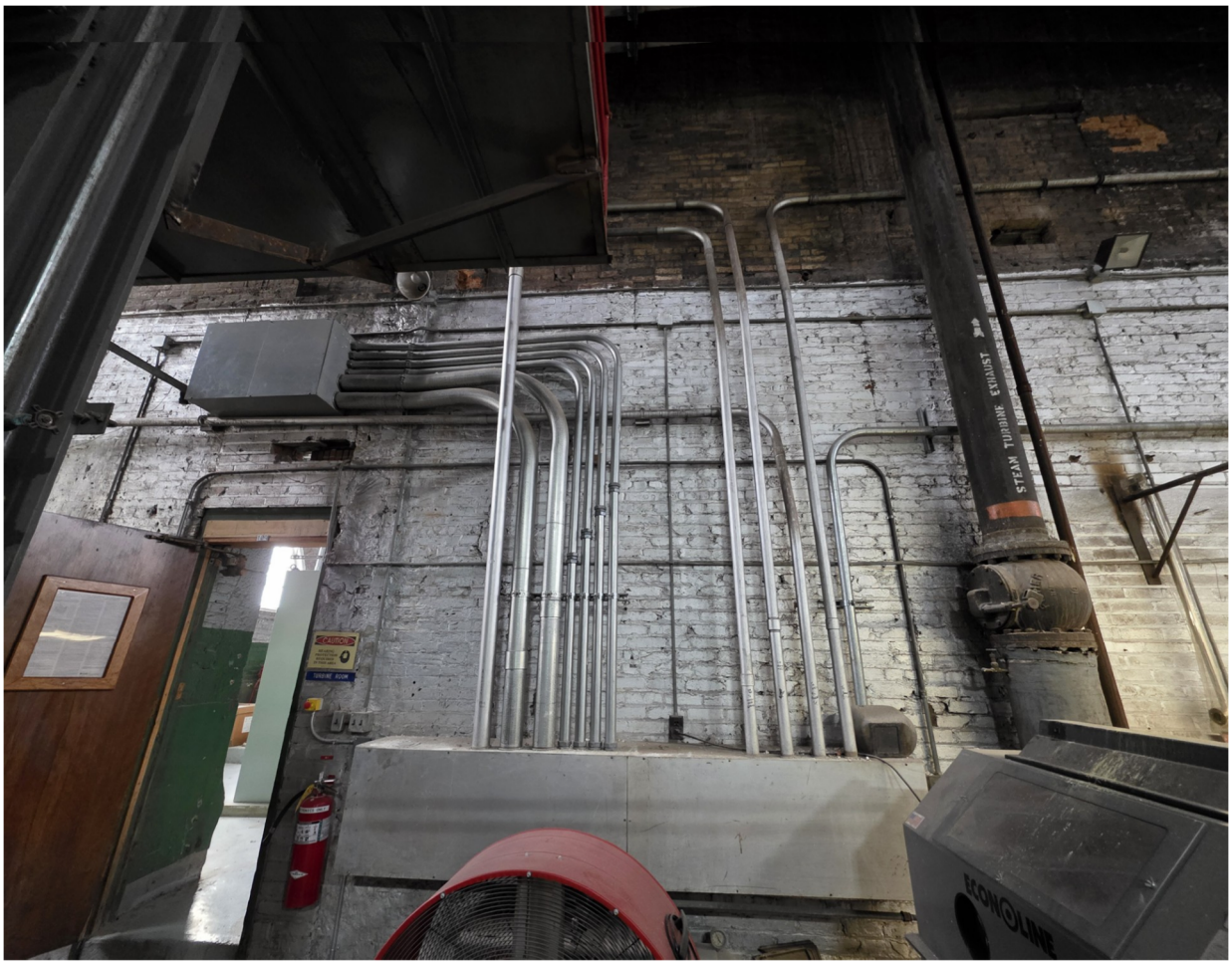
12. **Do all existing E-Stop buttons shown on the plans tie into boiler #3?**
    a) **Only the E-Stop shown on the drawings will connect to boiler #3 other E-stops are out of scope.**

13. **Please state electrical requirements for the air compressor and the fuel oil pump shown on sheet M300. Do they require additional electrical feeds or are they fed from the new boiler feed?**
    a) **The air compressor and fuel oil pump require feeds from the panel that the boiler will be fed from.**
14. **What is the maximum NOx for the boiler?**
    a) **The maximum NOx for the boiler shall be 60 ppm, not 30 ppm. FGR is not required or requested for the boiler.**

15. **Please confirm no external BAS controls are required.**
    a) **Confirmed, it will not interact with the BAS.**

16. **What size fuses are required for the 200A fused disconnect switch listed on** sheet E100?
    a) **150A**

17. **Existing integrity of the wall for the new wall mounted transformer appears to be poor. Please provide engineer recommended mounting means, recommended height, and location to support the rated weight of the transformer onto the degrading brick. Weight anticipated to be 350-400lbs. (Picture below for reference)**



    a) **Move transformer across from the MDP and place on a pad mount. See Sheet E100 in the attachments.**

CHANGES TO SPECIFICATIONS AND DRAWINGS

SPECIFICATIONS:

- **SECTION 00 0110 – TABLE OF CONTENTS**
  - **REPLACE** entire specification section.
- **SECTION 23 5216.05**
  - **ADD 2.05 F. NOx emissions shall be less than 60 ppm. Flue Gas Recirculation (FGR) is not required**
- **SECTION 26 0500 – COMMON WORK RESULTS FOR ELECTRICAL**
  - **ADD** specification to project
- **SECTION 26 0519 – LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**
  - **ADD** specification to project.
- **SECTION 26 0526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**
  - **ADD** specification to project
- **SECTION 26 0529 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**
  - **ADD** specification to project
- **SECTION 26 0533.13 – CONDUIT FOR ELECTRICAL SYSTEMS**
  - **ADD** specification to project
- **SECTION 26 0533.16 – BOXES FOR ELECTRICAL SYSTEMS**
  - **ADD** specification to project
- **SECTION 26 0553 – IDENTIFICATION FOR ELECTRICAL SYSTEMS**
  - **ADD** specification to project

DRAWINGS:

- **E100 – CONDUIT ROUTING PLAN**
  - **REPLACE** sheet with attached version.

ATTACHMENTS:

1. Specification Sections
2. Revision of Drawing Sheet
3. Boiler Substitution Requests
4. Hazard Material Testing Report
5. Contractor's Roof Warranty

END OF ADDENDUM

SECTION 00 0110

TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

1.01 **DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

SPECIFICATIONS

1.02 **DIVISION 01 – GENERAL REQUIREMENTS**

1.03 DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

Addendum #2

1.04 DIVISION 26 – ELECTRICAL

A.	26 0500	Common Work Results for Electrical
B.	26 0519	Low Voltage Electrical Power Conductors and Cables
C.	26 0526	Grounding and Bonding for Electrical Systems
D.	26 0529	Hangers and Supports for Electrical Systems
E.	26 0533.13	Conduit for Electrical Systems
F.	26 0533.16	Boxes for Electrical Systems
G.	26 0553	Identifcation for Electrical Systems
H.	26 2200	Low-Voltage Transformers
I.	26 2816.13	Enclosed Circuit Breakers
J.	26 2816.16	Enclosed Switches

1.05 DIVISION 40 – PROCESS INTERCONNECTIONS

A.	40 05 13	Common Work Results for Process Piping
B.	40 05 29	Supports and Anchors

END OF SECTION

SECTION 26 0500
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.02 SUMMARY

A. Section Includes:
1. Basic Requirements.
2. Detailed Requirements.
3. Demolition Requirements.
4. Coordination.
5. Quality Assurance.
6. Codes, Ordinances, & Permits.
7. Common requirements for electrical installation.
8. Painting.
9. Cleaning & Rubbish

1.03 SUBMITTALS

A. Shop Drawings:
1. Submit shop drawings, wiring diagrams, and descriptive literature on all equipment furnished in this contract. Contractor shall “approve” shop drawings as specified in Division 1 prior to submitting to Engineer for approval. Shop drawing submittals shall comply with Division 1 requirements.
2. Make submittals as soon as practicle after the signing of the contract. Shipment shall not be released until drawings and literature have been finally approved.
3. Shop drawings shall be checked by the Contractor for shape, dimensions, and details of attachment to the construction before submittal. Submitted shop drawings will be presumed to have been so checked by the Contractor.
4. The literature shall be complete, giving materials, gauges, weights, finishes, etc.
5. Number of copies required is the number of copies the Contractor desires returned, or the quantity listed in Division 1, whichever is greater.
6. Wiring diagrams shall be furnished for all communication and control systems under this contract.
7. In addition to the foregoing, the Contractor is to supply to the Construction Manager, for delivery to the Owner, bound in a single set, a complete shop drawing portfolio of all equipment indicated under the specific specification section. Submit these near completion of the project arranged and indexed according to the CSI format.

B. Test reports: Submit written installation test reports for review and approval immediately after testing has been satisfactorily completed.

C. Acceptance certificates: Submit written manufacturer, testing agency and/or Code authority acceptance certificates with project closeout documentation.

D. Warranty: Submit a written warranty statement detailing all system and equipment warranties. Warranties shall be signed by Submittal section and are not required for this Section.

E. Operation & Maintenance Instructions:
1. Refer to Division 1 for submittal and training requirements.
2. Furnish approved operation and maintenance instruction booklets covering each listed item of equipment installed under this contract. These booklets shall provide complete instructions on the proper operation, use and periodic maintenance, together with the source of replacement parts and service for the item of equipment covered.

3. Operation and maintenance manuals shall include copies of test reports, acceptance certificates and warranty information.
4. In addition to the foregoing, the Contractor shall demonstrate to the Owner's designated personnel the use of the systems listed herein and shall furnish three (3) typewritten copies of a general operation procedure. Include locations and functions of switches, circuit breakers, fuses, etc.
5. After final acceptance of all work and occupancy of the building, the Contractor shall have on the job, a qualified representative to make final adjustments of electrical systems and to instruct the Owner's representative in operating procedures, adjustment, and maintenance of system components, and to acquaint the Owner's representative with locations and functions of circuit breakers, fuses, switches, control devices, etc.

F. Record Drawings:
1. Refer to Division 1 for submittal requirements.
2. Record actual locations of equipment, devices, routing of conduits and locations of pull boxes for the following facilities:
   a. All branch circuit wiring
   b. Empty conduits for use by others
3. The information shall be neatly marked and the prints delivered to the Architect.

G. Contractor's Warranty:
1. All work shall be warranted to be free of defects and to function properly for one year from the date of substantial completion. Defects appearing within the warranty period shall be repaired to the satisfaction of the Architect/Engineer. Refer to Division 1 for additional requirements.
2. The warranty shall not obligate the Contractor for failure resulting from accident or from improper operation or care on the part of the Owner.

1.04 BASIC REQUIREMENTS

A. Discrepancies: Whenever a discrepancy or inconsistency exists between related information indicated on the contract drawings and/or specifications (such as differences between product descriptions and catalog numbers) this contractor shall obtain additional clarification and direction from the Architect/Engineer before proceeding.

B. Deficiencies: The Contractor and subcontractors shall resolve all known deficiencies and inadvertent omissions, including non-compliance with applicable codes, with the Architect/Engineer prior to ordering materials or proceeding with the work. Any work performed prior to receipt of instruction from the Architect/Engineer will be done so at the Contractor's risk.

C. Manufacturer's Catalog Numbers: Product series, model, or catalog numbers, whether indicated on drawings or specifications, shall not be considered complete. This Contractor shall not order any product based solely upon the stated catalog number. Furnish products including accessories and options necessary to match the full product description and its intended purpose and application based on all information available from the contract documents.

1.05 DETAILED REQUIREMENTS

A. Equipment and material specifications are minimum general requirements.

B. In cases where construction requirements and/or special features not mentioned are stated in subsequent sections, on the drawings, or by loc Code, the higher standard shall apply.

C. Coordinate rough-in work and other electrical provisions for temperature sensors, CO2 sensors, humidistats, thermostats, and other wall-mounted BMS wired devices shown on the mechanical drawings. Refer to the mechanical plans and the mechanical symbols list to identify such items. Install a double-gang junction box with a single-gang plaster ring with ¾-inch conduit to above accessible ceiling, unless otherwise indicated on mechanical drawings or specifications. Coordinate exact requirements with the contractor providing the wired device.

D. Electrical installations shall not hinder the regular maintenance of or replacement of mechanical equipment. Conduit and cable trays shall not be installed beneath suspended mechanical units. Coordinate and plan installations.

1.06 DEMOLITION REQUIREMENTS

A. A site visit will not be mandatory for a bid submittal.

B. Remove, relocate, and extend existing installations to accommodate new construction on existing project site.

C. Existing unused wiring shall be removed under this contract. Unused wiring shall be regarded as scrap materials to be recycled by this Contactor. Scrap value shall be determined by the Contractor and accounted for in the Contractor's bid. The Owner reserves the right to identify which items shall be salvaged-and, thus, carefully removed by this Contractor and placed in storage on site as directed by the Owner. The Contractor shall be responsible for the proper disposal of all demolished materials that the Owner does not want to salvage.

D. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities, equipment, light poles, etc. that remain in operation. Extension of conduit and wire to equipment shall be compatible with the surrounding area.
   1. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel and/or junction boxes as appropriate.
   2. Remove exposed abandoned conduit and raceway, including abandoned conduit and raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated clamps, hangers, supports, etc. associated with raceway removal.
   3. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
   4. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

1.07 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:
   1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   3. To allow right of way for piping and conduit installed at required slope.
   4. So connecting raceways, cables, cable trays, and wireways will be clear of obstructions and of the working and access space of other equipment.

B. Prior to bidding, this contractor shall determine conduit routings, including the means and methods of installation, maximum feeder/branch-circuit lengths, pull boxes, junction boxes, conduit bodies, fittings, and any other related work in accordance with the contract documents and the applicable building codes.

1.08 QUALITY ASSURANCE

A. Test Equipment Suitability and Calibration: Comply with NETA ATS, "Suitability of Test Equipment" and "Test Instrument Calibration."

B. Tests & Adjustments
   1. Contractor shall perform at his own expense, except for electrical energy, any tests that the Architect/Engineer may order to prove the performance of any device(s) and/or equipment supplied under this contract.
   2. Such tests will be limited to non-destructive test and will involve only direct reading(s) of the parameter(s) involved, i.e., actual trip rating or time delay of a circuit breaker may be required but coordination study is beyond the scope of this requirement.

3. Provide adjustments such as branch circuit re-arranging, circuit breaker trip settings, final selection of fuse sizes, motor starter overload element settings, and the like that may be indicated by the tests and/or to suit equipment to be installed.

1.09 CODES, ORDINANCES, & PERMITS

A. All governmental codes and ordinances that are applicable and in effect at the time and location of this work are hereby referenced as an integral part of the specification to establish minimum standards of design detail, materials, and workmanship. Extra payment will not be allowed for work or changes required by code enforcement authorities and/or utility companies. This is not to preclude the establishment of non-conflicting higher standards as may be specified herein and/or indicated on the drawings. In case of conflict between any of the standards established herein and a governmental code or ordinance, refer to the Architect/Engineer and obtain instructions before proceeding with the work involved.

B. Apply for, obtain, and pay for required permits and certificates of inspection

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In all Division 26 Part 2 articles where titles introduce lists, the following requirements apply to product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified or engineering pre-approved product substitution. No product manufacturer will be accepted after this bid unless approved through a contractual change or written acceptance by Engineer. See “Substitution Procedures” article herein.

2.02 PROPRIETARY REFERENCES

A. Except where there is indication to the contrary, the intent of this specification is to be open to all brand names and suppliers that offer equipment that complies with the stated requirements of capacity, function, quality configuration, size, shape, and operating characteristics that are compatible with the design objectives of the system and interfacing equipment.

B. The perceived operational limitations and maintenance requirements as well as the availability of suitable maintenance support will be evaluated in comparison to competing equipment as an important factor in deciding if an item of equipment is acceptable or not acceptable.

C. The product manufacturers listed are manufacturers that are believed to be producers of like equipment or materials and locally represented, with service capability and otherwise meeting the requirements of the contract documents. Reference to a brand name is not to be construed as a representation that the named supplier actually has available the equipment or materials that meet the detailed requirements of the contract documents.

D. Details of construction, control, or operation that are proprietary and not significant to the Owner's utilization of the equipment will not be used as a basis for qualifying or disqualifying any equipment.

2.03 SUBSTITUTIONS

A. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Engineer at least 7 days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The

Engineer's decision of approval or disapproval of a proposed substitution shall be final. Refer to Division 1 for additional requirements.

C. If the Engineer approves a proposed substitution prior to receipt of bids, such approval will be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

D. No substitutions will be considered after the contract award unless specifically provided in the contract documents.

2.04 UL LABEL

A. All materials, devices, etc. installed under this contract shall bear the UL label, or be UL listed as applicable except those specified items not covered by existing UL Standards.

PART 3 EXECUTION

3.01 REBATES

A. The work of this contract may include equipment, controls or systems to be furnished and/or installed that qualify for rebate(s) under local utility company energy conservation and efficiency programs.

B. In such instance(s), the Contractor shall cooperate with the Owner by providing information and filings as necessary for the Owner to receive the rebate(s).

3.02 INSPECTION OF SITE

A. Determine information regarding existing construction by the site inspection prior to bidding.

B. By submitting a bid for this work, contractor agrees he has inspected the existing site and familiarized himself with existing conditions and how they relate to the contract documents.

3.03 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Examine the site and drawings before proceeding with the layout and installation of this work. Locate work so it does not interfere with access to service for any equipment.

B. Obtain and follow manufacturer's installation instructions in the installation of all electrical equipment. Observe all restrictions imposed by the equipment manufacturer, UL label, NEC, or other applicable code in regard to setting; anchoring; hanging; clearances; electric, magnetic or thermal separation; shielding; weather and moisture protection. In case of conflict between the specifications herein and instructions or code governing the installation, notify the Engineer and receive his instructions before proceeding.

C. Arrange exposed work as closely as practicable to wall or ceiling surfaces and in accurate alignment with exposed features of structure and/or trim. Locate concealed work so fittings, connectors, and other projections will clear surfaces. Where the option of more than one material is given, selection shall be confined to those which may be properly installed.

D. Install all work in a neat and workmanlike manner by workmen thoroughly qualified in the trade or duties they are to perform. Rough work will be rejected.

E. The Contractor is responsible for correct size and location of chases, slots, and openings require and will be liable for any cutting or patching made necessary by his failure to make proper arrangements in this respect.

F. Maintain a competent full-time superintendent on the job to oversee and coordinate work with other trades, receive instructions from the Architect/Engineer, make layout of work to suit actual conditions, and to satisfy requirements of the drawings, specifications, and good workmanship.

3.04 PAINTING

A. Exposed electrical work in finished areas, walls, ceilings, etc. will be painted by the Electrician.

B. Exposed electrical work in unfinished areas will not require painting unless so noted.

C. Protect the manufacturer's finish on equipment that is so finished. Clean and/or touch-up as necessary to repair damage at the end of the job.

D. Paint exposed work installed under this contract with suitable primer and two coats of approved enamel, colors as specified or directed.

E. Protect the manufacturer's finish on equipment that is so finished. Clean and/or touch-up as necessary to repair damage at the end of the job.

3.05 CLEANING & RUBBISH

A. During the work, keep the premises clear of unnecessary accumulation of debris.

B. Plug or cap open ends of conduits to prevent the entrance of dirt and/or moisture during construction. Protect boxes, panel enclosures, etc. against the entrance of mortar, plaster, moisture, and other foreign material during construction, and thoroughly clean these spaces before pulling wires, and again, if necessary, before installing covers of fronts.

C. On completion of the work, remove all rubbish and debris resulting from the work or the work of subcontractors and dispose of same.

D. All equipment, fixtures, etc. shall be thoroughly cleaned of accumulated dust, plaster, or other dirt and left in a satisfactory condition for use.

END OF SECTION

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Electrical tape.

1.02 RELATED REQUIREMENTS

A. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

H. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.

I. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.

2) Phase B: Red.
3) Phase C: Blue.
4) Neutral/Grounded: White.

c. Equipment Ground, All Systems: Green.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
1. Feeders and Branch Circuits: Stranded.
2. Control Circuits: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
a. Installed Underground: Type XHHW-2.

2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

2.05 ACCESSORIES

A. Electrical Tape:
1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

PART 3 EXECUTION

3.01 INSTALLATION

A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. Arrange circuiting to minimize splices.
3. Maintain separation of wiring for emergency systems in accordance with NFPA 70.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent

support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

G. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

H. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

I. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

J. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

K. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

L. Insulate ends of spare conductors using vinyl insulating electrical tape.

M. Install firestopping to preserve fire resistance rating of partitions and other elements.

N. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION

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SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

1.02 SUBMITTALS

A. Field quality control test reports.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Engineer. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

F. Separately Derived System Grounding:
   1. Separately derived systems include, but are not limited to:
      a. Transformers (except autotransformers such as buck-boost transformers).
   2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
   3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
   4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
   5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

G. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical

conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 26 0553.

3.02 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.13.

C. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

D. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

E. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION

SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS

A. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.

B. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 5. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Comply with MFMA-4.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

E. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

F. Secure fasteners according to manufacturer's recommended torque settings.

G. Remove temporary supports.

END OF SECTION

SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Aluminum rigid metal conduit (RMC).

C. PVC-coated galvanized steel rigid metal conduit (RMC).

D. Electrical metallic tubing (EMT).

E. Rigid polyvinyl chloride (PVC) conduit.

F. Liquidtight flexible nonmetallic conduit (LFNC).

G. Conduit fittings.

1.02 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC).

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S).

C. ANSI C80.5 - American National Standard for Electrical Rigid Metal Conduit -- Aluminum (ERMC-A).

D. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction.

F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT).

G. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit.

H. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC).

I. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.

J. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit.

K. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit.

L. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.

M. NFPA 70 - National Electrical Code.

N. UL 6 - Electrical Rigid Metal Conduit-Steel.

O. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel.

P. UL 514B - Conduit, Tubing, and Cable Fittings.

Q. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings.

R. UL 797 - Electrical Metallic Tubing-Steel.

S. UL 1242 - Electrical Intermediate Metal Conduit-Steel.

T. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the

most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Under Slab on Grade: Use rigid PVC conduit or HDPE conduit.
   2. Exterior, Direct-Buried: Use rigid PVC conduit or HDPE conduit.
   3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
   4. Where rigid polyvinyl (PVC) or HDPE conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.

D. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

E. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

F. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

G. Exposed, Exterior: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit.

H. Corrosive Locations Above Ground: Use PVC-coated galvanized steel rigid metal conduit, aluminum rigid metal conduit, or reinforced thermosetting resin conduit (RTRC).

2.02 CONDUIT REQUIREMENTS

A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.

B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Branch Circuits: 3/4 inch (21 mm) trade size.
   2. Underground, Exterior: 1 inch (27 mm) trade size.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 ALUMINUM RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use aluminum.

3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.06 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil (1.02 mm).

C. PVC-Coated Fittings:
   1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
   2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
   4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil (1.02 mm).

D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil (0.38 mm).

2.07 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.

2.08 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.09 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

A. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL 1660.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for the type of conduit to be connected.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.

E. Install intermediate metal conduit (IMC) in accordance with NECA 101.

F. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

G. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

H. Install liquidtight flexible nonmetallic conduit (LFNC) in accordance with NECA 111.

I. Conduit Support:
   1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

J. Connections and Terminations:
   1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
   2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
   3. Use suitable adapters where required to transition from one type of conduit to another.
   4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
   5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
   6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
   7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

K. Penetrations:
   1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
   2. Make penetrations perpendicular to surfaces unless otherwise indicated.
   3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
   4. Conceal bends for conduit risers emerging above ground.
   5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
   6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
   7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.

8. Install firestopping to preserve fire resistance rating of partitions and other elements.

L. Underground Installation:
   1. Minimum Cover, Unless Otherwise Indicated or Required:
      a. Underground, Exterior: 42" inches.
      b. Under Slab on Grade: 12 inches (300 mm) to bottom of slab.
   2. Provide underground warning tape in accordance with Section 26 0553 along entire conduit length.

M. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
   2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
   3. Where conduits are subject to earth movement by settlement or frost.

N. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
   1. Where conduits pass from outdoors into conditioned interior spaces.
   2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

O. Provide grounding and bonding in accordance with Section 26 0526.

END OF SECTION

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SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).

1.02 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   3. Use suitable concrete type boxes where flush-mounted in concrete.
   4. Use suitable masonry type boxes where flush-mounted in masonry walls.
   5. Use raised covers suitable for the type of wall construction and device configuration where required.
   6. Use shallow boxes where required by the type of wall construction.
   7. Do not use "through-wall" boxes designed for access from both sides of wall.
   8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
   9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
   10. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
   1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA EN 10250 Environment Type, Unless Otherwise Indicated:
   3. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

E. Install boxes plumb and level.

F. Install boxes as required to preserve insulation integrity.

G. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

H. Close unused box openings.

I. Provide grounding and bonding in accordance with Section 26 0526.

END OF SECTION

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SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Warning signs and labels.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
   2. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
      a. Service equipment.
      b. Industrial control panels.
      c. Motor control centers.
      d. Elevator control panels.
      e. Industrial machinery.

B. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
   2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
   2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.
   3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
   4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
   5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
   2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
   1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).

2. Legend:
   a. Equipment designation or other approved description.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
   a. Equipment Designation: 1/2 inch (13 mm).
5. Color:
   a. Normal Power System: White text on black background.

2.03 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
   1. Materials:
      a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.

C. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Interior Components: Legible from the point of access.
   6. Conductors and Cables: Legible from the point of access.

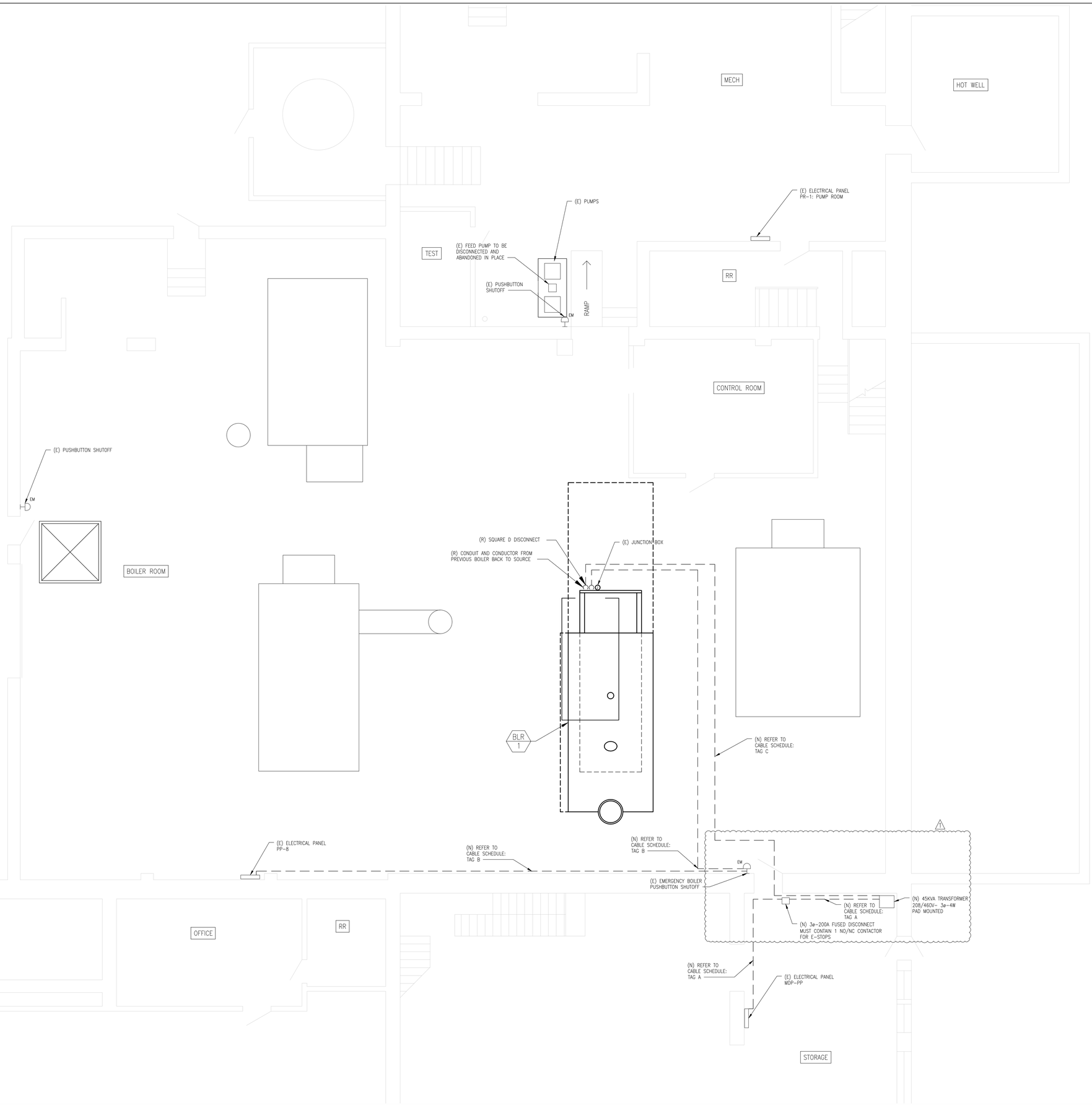
C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Secure rigid signs using stainless steel screws.

END OF SECTION



KCL ENGINEERING

KCL Engineering

300 4th Street
West Des Moines, Iowa 50265

info@kclengineering.com
515.724.7938

KCL Project Number:	25224
Date:	11-14-2025
Drawn By:	CJC
Checked By:	KCL

NOT FOR CONSTRUCTION

Revisions	Date	No.
REV. 0	11-14-2025	
REV. 1	01-09-2026	

CONTRACT RFB - 947400-01 - HHS IMHI BOILER #3 REPLACEMENT

2277 IOWA AVE.
INDEPENDENCE - IOWA - 50644

Sheet Name:
CONDUIT ROUTING PLAN

Scale:
1/8" = 1'-0"

Sheet:
E100

1/9/2026 2:24 PM

SUBSTITUTION REQUEST FORM

Project: HHS IMHI Boiler #3 Replacement

Substitution Request Number:

From: Houston Worth

To: Iowa Department of Administrative Services

Date: 1/5/2026

A/E Project Number: 25224

Re:

Specification Title: Burner Substitution

Description: External burner

Section: 23 Page: 140

Article/Paragraph: 2.05 A

Proposed Substitution: External burner

Manufacturer: Limpsfield Address: Unit 7 Concorde Business Centre
Airport Industrial Estate
Main Road, Biggin Hill
Kent, TN16 3YN
United Kingdom

Phone: +44 (0) 1959 576 633

Trade Name: Limpsfield Comnustion

Model No.:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product: The proposed substitution will be an external "gun style" burner rather than an integral burner design

☐ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item: CleaverBrooks is the only manufacture that offers an integral burner arfiretube boiler. Only CB rep can quote that and we would like to proived a quote for this job as well.

Similar Installation:

Project: Architect:

Address: Owner:

Date Installed:

Proposed substitution affects other parts of Work: ☑ No ☐ Yes; explain

Supporting Data Attached: ☑ Drawings ☑ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Houston Worth

Signed by: Houston Worth

Firm: American Boiler

Address: 2117 Dixon St, Des Moines, IA 50316

Telephone: 816-400-9224

Attachments:

A/E's REVIEW AND ACTION

☒ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date: 1/8/2026

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐

SUBSTITUTION REQUEST FORM

Project: HHS IMHI Boiler #3 Replacement

Substitution Request Number: 2

From: Houston Worth

To: Iowa Department of Administrative Services

Date: 1/5/2026

A/E Project Number: 25224

Re:

Specification Title: Burner Substitution

Description: External burner

Section: 23 Page: 140

Article/Paragraph: ~~2.05 A~~ 2.01A

Proposed Substitution: Victory Energy Boiler

Manufacturer: Victory Address: 10701 E. 126th St. N., Collinsville, Oklahoma 74021 Phone: + 918.274.0023

Trade Name: Victory Energy Model No.: F2-DB-700HP-S150-NE

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☑ More than 10 years old

Differences between proposed substitution and specified product: Requesting review of dimensions for the for Victory Boiler as we are not quoting base of design boiler

☐ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item: I do not rep the approved boilers (Cleaver, Fulton, ect)

Similar Installation:

Project: Architect:

Address: Owner:

Date Installed:

Proposed substitution affects other parts of Work: ☑ No ☐ Yes; explain

Supporting Data Attached: ☑ Drawings ☑ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Houston Worth

Signed by: Houston Worth

Firm: American Boiler

Address: 2117 Dixon St, Des Moines, IA 50316

Telephone: 816-400-9224

Attachments:

A/E's REVIEW AND ACTION

☒ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date: 1/9/2026

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐

ASBESTOS INSPECTION REPORT

Inspection Address:

Mental Health Institute
Project 9474
Powerhouse, Boiler 3
2277 Iowa Ave
Independence, IA 50655
Project #: 25-30398

Prepared for:

Story Construction
2810 Wakefield Circle
Ames, IA 50010
Attn: Mason Gott

Prepared by:

Travis J Haas

Travis J. Haas, Inspector

1/4/26
Date

25-13724
Inspector #

8/2/26
License Expiration date

TABLE OF CONTENT

SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspected Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (I) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packaging, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials, i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspected asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility of these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms, i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspected ACM.

3. **Debris: In** areas where damaged ACM may be found there may and usually will be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units, i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

8. **An Asbestos Code Sheet** is included with the Inspector's inspection report, which informs the client as to the Homogeneous Codes used during the inspection process.

9. **Caution-** Regarding Inspection results- Floor tiles, adhesives, and drywall (mud) found to not contain asbestos should be re-analyzed under the “Chatfield Method” of TEM analysis. Many times, the results from having these materials analyzed under PLM result in false positives or false negatives. After reviewing your report, please notify the inspector if you want these samples analyzed under the “Chatfield Method”.

10. Any sample less than 10% asbestos may be Point Counted. Point counting is a more accurate method of analyzing bulk samples. The results of the point counting are the results that will determine if the material will be treated as asbestos.

11. Asbestos inspections are performed based on current understanding of the regulations. As new interpretations of the regulations are made aware of by the EPA, DNR, and Iowa Division of Labor. Advanced Environmental Testing and Abatement Inc. will adapt their inspections to comply with these new procedures. If additional sampling is required by the different agencies, Advanced Environmental will do the additional sampling. The owner is responsible for the additional cost for these samples as well as labor.

12. Advanced Environmental shall not be responsible for any cost of abating any additional asbestos discovered in any renovation or demolition activities. Any additional items discovered shall be tested when they become accessible. For example, old adhesives may be under new floor tiles and adhesives. Additional materials may be concealed in walls, under multi layers of flooring, etc.

13. All amounts listed are estimates. It is up to other contractors to field verify any amounts that are listed within this report.

14. All material that looks similar should be treated as asbestos containing materials.

15. Asbestos Material containing <1%. Some material tested for asbestos may contain trace amounts of asbestos and be below the threshold for asbestos contain material according to both the Iowa DNR and Iowa State Code. However, the Federal Occupational Safety and Health Administration still have some regulations that contractors must follow under 29 CFR 1926.1101. Contractors working with asbestos material with <1% asbestos must still produce a negative and initial exposure assessment, completed by a “competent person”. Contractors must follow 29 CFR 1926. 1101 (g)(1)(ii) and (iii) and 29 CFR 1926. 1101(g)(3)(i), (ii), and (iv). Please contact Advanced Environmental Testing and Abatement, Inc. for consultation on how to handle material with <1% asbestos.

16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes every effort to core roof samples through all layers. If flashing is identified as

asbestos containing, all tar on walls and adjacent roof decks shall be bid as and treated as asbestos containing unless separately and disproved by the abatement contractor.

17. Prior to the start of any demolition, have the demolition contractor review the asbestos inspection report, do a building walk through and sign that he agrees with the report and sees no questionable items. If any suspect material is discovered during the demolition, the demolition contractor shall stop immediately and inform the building owner of the suspect materials.

18. If asbestos containing materials are found during demolition:
    1: Stop demolition
    2: Call inspector
    3: Notify DNR of change through notification and phone call:
        515-725-9576

Options for handling found asbestos during demolition activities:

1: Have the inspector stay on site and direct what ACM (RACM) should go as RACM or what they want to go as regular construction waste.
2: Least logical: Most Expensive: Treat all waste as RACM. This isn't necessary in most cases. Demolition contractors have the most to gain in this option.

19. The inspector shall not be responsible for the cost of abating any "found" asbestos after the original inspection. The inspector did not create them just aided in identifying them. The owner pays for all abatement and RACM found or made on the site. Payment for the inspection means acceptance of the conditions herein – no exceptions.

ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non-Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non-friable
NSM = Not Suspect Material
P or PH = Previous History
PP = Patched Plaster/Drywall
PSA = Sand Plaster
PSM = Smooth Plaster
S = Sample/Samples/Sampled
SCT = Suspended Ceiling Tile
SR = Sample Result
ST = Storage Tank
SUR = Surfacing
T = Thermal
Thermal Pipe Measurement = Linear Ft
TR = Transite
TSI = Thermal System Insulation
VC = Vibration Cloth
VDW = Vinyl Covered Drywall
W = Walls
WD = Wood Door
N = North
S = South
E = East
W = West

1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
   Y = Considered Asbestos Containing Material
   P or PH = Previous History
   N/A = Not Analyzed
   <1% = Contains less than 1% Asbestos Containing Material
   >1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non-Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non-Friable ACM.

SECTION 4

ASBESTOS INSPECTION REPORT SUMMARY

METHOD:

All collected samples were submitted to EMC LABS, INC., located in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP #101926-0) for Polarized Light Microscopy (PLM) analysis. The sampling was conducted by a State of Iowa licensed asbestos inspector and followed the National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos-containing materials (ACMs) were analyzed using EPA Method 600-R93-116 via PLM.

OVERVIEW:

Advanced Environmental Testing and Abatement, Inc. performed an Asbestos Containing Materials (ACM) Inspection on December 12th and 17th, 2025. The purpose of this inspection was to identify the presence of asbestos-containing materials prior to the future renovations of the building.

- **Property Description:**
  - Multi story powerhouse
- **Occupancy Status at Time of Inspection:** Occupied
- **Scope of Inspection:** Boiler 3

RESULTS:

- **Total Bulk Samples Collected:** Nine (9 samples)
- **Asbestos Detected:** Three (3 samples)

All building materials similar in appearance, color, and/or texture to those determined to contain asbestos must be assumed to contain asbestos throughout the building.

SECTION 5

POSITIVE MATERIALS:

The following samples tested positive (>1%) for asbestos or are assumed to contain asbestos:

Samples 121225-15, 16, 17: TSI located directly above boiler number 3 contained asbestos.

REGULATION REVIEW

The United State Environmental Protection Agency definition of asbestos containing materials (ACM) is a material with an asbestos content greater than 1%. According to Iowa Division of Labor, ACM is any material found to contain asbestos, regardless of its concentration, and shall be regulated as asbestos waste.

CONCLUSIONS AND RECOMMENDATIONS

The results of laboratory testing during the asbestos renovations contained three (3) positive samples for asbestos.

Advanced Environmental Testing and Abatement, Inc. make the following recommendations and conclusions:

1. If any additional suspect building materials are found during renovation, contractor should stop and notify inspector immediately. Additional materials at that time can be tested for asbestos.
2. At the time of the inspection the boiler was operational. Prior to disposal of the boiler, the interior of the boiler will need to be inspected for asbestos. Until that time, all interior portions of the boiler are assumed to contain asbestos.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Facility Name/Site Location					
			MHI Boiler 3 Powerhouse		**Inspected By:** Travis Haas
Sample No	**Material**	**Color**	**Location**	**Current Condition**	**Results**
121225-11	Gasket	Brown	Front of boiler 3	Good	0%
121225-12	Gasket	Brown	Rear of boiler 3	Good	0%
121225-13	Gypsum	White	Roof underside	Good	0%
121225-14	Gypsum	White	Roof underside	Good	0%
121225-15	TSI	White	Pipe above boiler 3	Good	15% Chrysotile 5% Amosite
121225-16	TSI	White	Pipe above boiler 3	Good	15% Chrysotile 5% Amosite
121225-17	TSI	White	Pipe above boiler 3	Good	15% Chrysotile 5% Amosite
121725-1A	Sealant	Yellow	Boiler 3 stack on roof, sealant on stack	Good	0%
121725-1B	Sealant	Yellow	Boiler 3 stack on roof, sealant on stack	Good	0%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0343209

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	25-30398
Address:	803 RICKER ST	Date Received:	12/16/2025
	WATERLOO, IA 50703	Date Analyzed:	12/17/2025
Collected:	12/15/2025	Date Reported:	12/17/2025
Project Name:	MENTAL HEALTH INSTITUTE-PROJECT 9474-POWERHOUSE	Submitted By:	TRAVIS HAAS
		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0343209-001 121225-11		Gasket, Brown	No	None Detected		Fibrous Glass Carbonates Non-Fibrous Binder/Filler	95% 5%
0343209-002 121225-12		Gasket, Brown	No	None Detected		Fibrous Glass Carbonates Non-Fibrous Binder/Filler	95% 5%
0343209-003 121225-13		Gypsum, White	No	None Detected		Carbonates Gypsum Non-Fibrous Binder/Filler	 100%
0343209-004 121225-14		Gypsum, White	No	None Detected		Carbonates Gypsum Non-Fibrous Binder/Filler	 100%
0343209-005 121225-15		TSI, White	Yes	Chrysotile Amosite	15% 5%	Gypsum Diatoms Non-Fibrous Binder/Filler	 80%
0343209-006 121225-16		TSI, White	Yes	Chrysotile Amosite	15% 5%	Gypsum Diatoms Non-Fibrous Binder/Filler	 80%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0343209

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Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	25-30398
Address:	803 RICKER ST	Date Received:	12/16/2025
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Collected:	12/15/2025	Date Reported:	12/17/2025
Project Name:	MENTAL HEALTH INSTITUTE-PROJECT 9474-POWERHOUSE	Submitted By:	TRAVIS HAAS
		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents
0343209-007 121225-17		TSI, White	Yes	Chrysotile Amosite	15% 5%	Gypsum Diatoms Non-Fibrous Binder/Filler 80%

Analyst - Ryan McDonough

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0343416

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	25-30398
Address:	803 RICKER ST	Date Received:	12/19/2025
	WATERLOO, IA 50703	Date Analyzed:	12/22/2025
Collected:	12/18/2025	Date Reported:	12/22/2025
Project Name:	MENTAL HEALTH INSTITUTE-PROJECT 9474-POWERHOUSE	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0343416-001 121725-1A	BOILER 3	Sealant, Clear/ Yellow	No	None Detected	Silicone Non-Fibrous Binder/Filler 100%
0343416-002 121725-1B	BOILER 3	LAYER 1 Sealant, Clear/ Yellow	No	None Detected	Silicone Non-Fibrous Binder/Filler 100%
		LAYER 2 Roof Material, Black	No	None Detected	Cellulose Fiber 35% Carbonates Quartz Non-Fibrous Binder/Filler 65%

Analyst - Ramon Suarez

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

Certificate No: 5LM08012516AIR

Expiration Date: August 1, 2026

This is to certify that

Travis J. Haas

has attended and successfully completed an

ASBESTOS INSPECTOR

REFRESHER TRAINING COURSE

permitted by

the State of Minnesota under Minnesota Rules 4620.3702 to 4620.3722

and meets the requirements of

Section 206 of Title II of the Toxic Substances Control Act (TSCA)

conducted by

Lake States Environmental, Ltd.

Attended Remotely on August 1, 2025

Examination Date: August 1, 2025

Lake States Environmental, Ltd.
P. O. Box 645, Rice Lake, WI 54868
www.lakestates.com
(800) 254-9811

Grant J Grassle

Training Instructor

TRAVIS HAAS

DOB: 01-09-1982

Issued: 08-07-2025

This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
SUPERVISOR	25-13616	06-27-2026
INSPECTOR	25-13724	08-01-2026

IOWA

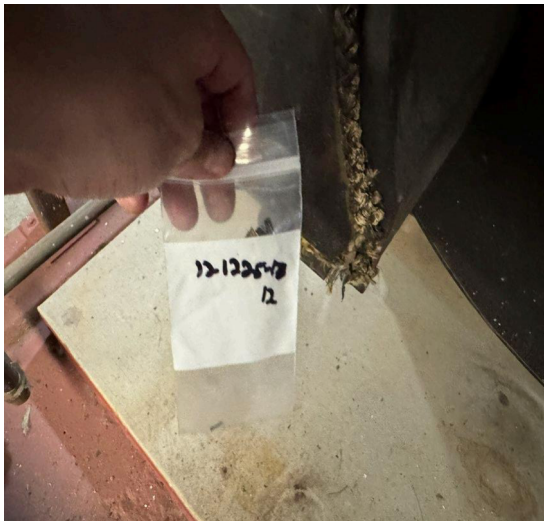
Asbestos

Larry Johnson, Jr.
Labor Commissione

APPENDIX C
PICTURES

JOB#:	25-30398	NAME:	MHI Powerhouse Boiler 3

121225-11: Gasket material from front of boiler number 3 negative for asbestos.



121225-12: Gasket material from rear of boiler number 3 negative for asbestos.

121225-13 and 14: Gypsum material from underside of roof decking negative for asbestos.

121225-15: TSI from white pipe directly above boiler number 3 positive for asbestos. (Believe new boiler will tie into this pipe).

121225-16: TSI from white pipe directly above boiler number 3 positive for asbestos. (Believe new boiler will tie into this pipe).

121225-17: TSI from white pipe directly above boiler number 3 positive for asbestos. (Believe new boiler will tie into this pipe).

121725-1A: Sealant on boiler 3 stack on roof negative for asbestos (missing picture).

121725-1B: Sealant on boiler 3 stack on roof negative for asbestos (missing picture).

ForSure
ROOFING & SHEET METAL

Workmanship Warranty

I, For Sure Roofing and Sheet Metal, LLC, do hereby warrant that all labor and material furnished and work performed in conjunction with the above referenced project are in compliance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of (1) year or a time as specified in the Project Manual from the Date of Turnover.

This Warranty commences on a year after substantial completion, that is 08/24/2022.

Should any defects develop during the warranty period due to improper material, workmanship, or arrangement, the same, including adjacent work displaced, shall be made good by the undersigned at no expense to the Owner.

The Owner will give Subcontractor written notice of defective work. Should the Subcontractor fail to correct defective work within Thirty (30) days after receipt of written notice, Owner may, at his or her option, correct and charge Subcontractor cost for such correction. Subcontractor agrees to pay such charges upon demand. Nothing in the above shall be deemed to apply to work which has been abused or neglected by the Owner.

Company Name: State of Iowa Administrative Services

Job Name: DHS IMHI Powerplant Roof Replacement

Signature: Reid Frana

Printed Name: Reid Frana

Title: Project Manager

Date: 10/11/2022