



Central County Transportation Authority  
Purchasing Division  
241 W. South Street  
Kalamazoo, MI 49007  
Phone: 269.337.8020  
www.kmetro.com

**NON-MANDATORY Pre-Bid Meeting – Thursday, October 24, 2022 at 10:00 a.m. Local Time**  
**Location: CCTA Building, 530 North Rose Street, Kalamazoo**

**INVITATION FOR BID (IFB)**

The Central County Transportation Authority is soliciting sealed bids for:

**Project Name: Kalamazoo Transit Center**  
**Attic Insulation**

**Bid Reference #: 91038-011.0**

**IFB ISSUE DATE: October 7, 2022**

**BID DUE/ OPENING DATE: November 3, 2022 @ 3:00 p.m. Local Time**

*Facsimile Proposals Will Not Be Accepted*

**MAILING ADDRESS & INSTRUCTIONS**

**Mail to:**

City of Kalamazoo  
Purchasing Department  
241 West South Street  
Kalamazoo, MI 49007

**Questions about this IFB should be directed to:**

Department Contact: Rob Branch  
Deputy Director of Fleet and Facilities  
(269) 337-8235

You are invited to submit a bid for this project. Specifications, terms, conditions and instructions for submitting bids are contained herein. This Invitation for Bid with all pages, documents and attachments contained herein, or subsequently added to and made a part hereof, submitted as a fully and properly executed bid shall constitute the contract between the CCTA and the successful bidder when approved and accepted on behalf of the CCTA by an authorized official or agent of the CCTA. Please review the bid document as soon as possible and note the **DEADLINE FOR QUESTIONS** in the Instructions to Bidders.

All bidders shall complete and return the Bid and Award page(s) and submit all information requested herein in order for a bid to be responsive. The bid document shall be returned in its entirety, in a properly identified and sealed envelope to the Purchasing/Risk Management Division at the above address. **BIDS MUST BE RECEIVED BEFORE THE DUE DATE - LATE BIDS WILL NOT BE CONSIDERED.** The CCTA reserves the right to postpone the bid opening for its own convenience.

**TABLE OF CONTENTS**

<u>SECTION</u>	<u>PAGE #</u>	<u>APPENDICES</u>
I Instructions to Bidders	1	Appendix A
II Bid & Award Signature Page	2 – 11	FTA Requirements
III Specifications and Requirements	12 – 13	Prevailing Wage
IV Indemnity and Insurance	14 – 15	Technical Specifications
V Terms and Conditions	16 – 19	Project Plans/Drawing

**STATEMENT OF NO BID**

**NOTE: If you DO NOT intend to bid on this commodity or service, please complete and return this form immediately.** Your response will assist us in evaluating all responses for this important project and to improve our bid solicitation process.

The Purchasing Division of the CCTA wishes to keep its proposers list file up-to-date. If, for any reason you cannot supply the commodity/service noted in this bid solicitation, this form must be completed and returned to remain on the particular bid list for future projects of this type.

**If you do not respond to this inquiry within the time set for the bid opening date and time noted, we will assume that you can no longer supply this commodity/service, and your name will be removed from this bid list.**

- \_\_\_\_\_ Specifications too "tight", i.e. geared toward one brand or manufacturer only (explain below).
- \_\_\_\_\_ Specifications are unclear (explain below).
- \_\_\_\_\_ We are unable to meet specifications.
- \_\_\_\_\_ Insufficient time to respond to the Invitation for Bid.
- \_\_\_\_\_ Our schedule would not permit us to perform.
- \_\_\_\_\_ We are unable to meet bond requirements.
- \_\_\_\_\_ We are unable to meet insurance requirements.
- \_\_\_\_\_ We do not offer this product or service.
- \_\_\_\_\_ Remove us from your proposers list for this commodity or service.
- \_\_\_\_\_ Other (specify below).

REMARKS: \_\_\_\_\_  
\_\_\_\_\_

SIGNED: \_\_\_\_\_ NAME: \_\_\_\_\_  
(Type or Print)

TITLE: \_\_\_\_\_ DATE: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_  
(if any)

ADDRESS: \_\_\_\_\_  
(Street address) (City) (State) (Zip)

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

EMAIL: \_\_\_\_\_

## SECTION I - INSTRUCTIONS TO BIDDERS

1. **EXAMINATION OF BID DOCUMENT**-Before submitting a bid, bidders shall carefully examine the specifications and shall fully inform themselves as to all existing conditions and limitations. The bidder shall indicate in the bid the sum to cover the cost of all items included on the bid form.
2. **PREPARATION OF BID**-The bid shall be legibly prepared in ink or typed. If a unit price or extension already entered by the bidder on the Bid and Award form is to be altered, it shall be crossed out and the new unit price or extension entered above or below and initialed by the bidder with ink. The bid shall be legally signed and the complete address of the bidder given thereon.

All bids shall be tightly sealed in an envelope plainly marked SEALED BID and identified by project name, bid opening date and time. Bids opened by mistake, due to improper identification, will be so documented and resealed. The Purchasing/ Risk Management Division will maintain and guarantee confidentiality of the contents until the specified opening date and time. Facsimile bids will not be accepted.

3. **EXPLANATION TO BIDDERS**-Any binding explanation desired by a bidder regarding the meaning or interpretation of the Invitation for Bid (IFB) and attachments must be requested in writing, **at least 5 business days before the bid opening** so a reply may reach all prospective bidders before the submission of bids. Any information given to a prospective bidder concerning the IFB will be furnished to all prospective bidders as an amendment or addendum to the IFB if such information would be prejudicial to uninformed bidders. Receipt of amendments or addenda by a bidder must be acknowledged in the bid by attachment, or by letter or fax received before the time set for opening of bids. Oral explanation or instructions given prior to the opening will not be binding.
4. **CASH DISCOUNTS**-Discount offered for payment of less than thirty (30) days will not be considered in evaluating bids for award. Offered discounts of less than thirty (30) days will be taken if payment is made within the discount period, even though not considered in evaluation of the bid.
5. **WITHDRAWAL OF BIDS**-Bids may be withdrawn in person by a bidder or authorized representative, provided their identity is made known and a receipt is signed for the bid, but only if the withdrawal is made prior to the exact time set for receipt of bid. No bid may be withdrawn for at least ninety (90) days after bid opening.
6. **ALTERNATE BIDS**-bidders are cautioned that any alternate bid, unless specifically requested or any changes, insertions or omissions to the terms and conditions, specifications or any other requirement of this IFB may be considered non-responsive, and at the option of the CCTA, result in rejection of the alternate bid.
7. **LATE BIDS**-Any bid received at the office designated herein after the exact time specified for receipt will not be considered. (Note: The CCTA reserves the right to consider bids that have been determined by the CCTA to be received late due to mishandling by the CCTA after receipt of the bid and no award has been made.)
8. **UNIT PRICES**-If there is a discrepancy between unit prices and their extension, unit prices shall prevail.

**SECTION II  
BID AND AWARD**

The undersigned having become thoroughly familiar with and understanding all of the bid/contract documents incorporated herein agrees to provide services for insulating the attic of the Kalamazoo Transportation Center. **See Section III, Scope of Work for more details.**

**Transit Center Attic Insulation**

The CCTA is seeking bids to insulate the rafter spaces in the Historic Depot attic using closed cell foam insulation and to provide and install two mini-split mechanical units and a condensing unit to condition the space.

DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL
Insulation of Attic Space	LS	\$	1	\$
Mini-split Mechanical Unit	EA	\$	2	\$
Wall Mounted Condensing Unit	EA	\$	1	\$

**Total Amount: \$** \_\_\_\_\_

Guaranteed start of the project shall be **FOB CCTA**, \_\_\_\_\_ working days after receipt of notification of award. **The deadline for completion is 240 days after Notice to Proceed. See timeline section for specifics.**

**FOB destination: CCTA, 530 North Rose Street, Kalamazoo, MI 49007**

Proposer/Contractor has examined and carefully studied the bidding documents and attachments, and acknowledges receipt of the following addenda:

Addendum No: \_\_\_\_\_

Dated: \_\_\_\_\_

Proposer shall provide all of the information as requested herein with their bid. **Failure to do so and/or failure to provide post-bid requested information may be cause for rejecting the bid as non-responsive.**

By my signature below, I certify that the firm bidding on this contract, when making hiring decisions, does not use a past criminal conviction as a bar to or preclude a person with a criminal conviction from being considered for employment with the bidding firm unless otherwise precluded by federal or state law. I further certify that I have read and agree to be bound by the provisions of the CCTA’s Non-Discrimination Clause found in Appendix A as updated by City Ordinance 1856.

Signed: \_\_\_\_\_ Name: \_\_\_\_\_

Title: \_\_\_\_\_

### Bidder's Form

(Please return this form with your bid submission.)

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_  
Street City State Zip

Website: \_\_\_\_\_

Contact: \_\_\_\_\_  
Name Title

Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Fax: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Email: \_\_\_\_\_

Years in Business: \_\_\_\_\_

Number of Employees: \_\_\_\_\_

Annual Gross Receipts of your firm:

- under \$150,000
- \$150,001 to \$300,000
- \$300,001 to \$500,000
- \$500,001 and up

Special Status:

- DBE
- Small Business

BLANK forms are NOT acceptable. If DBE subcontractor opportunities are available, please fill out sections 1 thru 5. If no subcontractor opportunities available fill out section 6.

**SIGNATURES ARE REQUIRED.**  
**DBE PARTICIPATION FORM**

Separate information is required for each DBE subcontractor. This form may be duplicated as necessary.

1) DBE Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

2) Dollar amount awarded: \_\_\_\_\_

3) Description of work to be performed: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4) CONTRACTOR’S COMMITMENT TO USE DBE FIRM

\_\_\_\_\_ is committed to utilize the DBE contractor  
(Name of Contractor)  
in the manner and amount described on this form.

Dated \_\_\_\_\_  
(Authorized Signature)

5) DBE’S COMMITMENT TO PARTICIPATE

\_\_\_\_\_, as a DBE firm, is committed to perform  
(Name of subcontractor/supplier)  
the work as described above for the amount specified.

Dated \_\_\_\_\_  
(Authorized Signature)

6) NO SUBCONTRACT OPPORTUNITIES, AVAILABLE.

\_\_\_\_\_, has no subcontractor opportunities  
(Name of subcontractor/supplier)  
available for work to be performed.

Dated \_\_\_\_\_  
(Authorized Signature)

**DBE PARTICIPATION FORM**

**Instruction Diagram**

Separate information is required for each DBE subcontractor. This form may be duplicated as necessary.

DBE Firm Name: \_\_\_\_\_  
Sub contractor name and address

Address: \_\_\_\_\_

1) Dollar amount awarded: \_\_\_\_\_  
Amount awarded to Sub contractor

2) Description of work to be performed: \_\_\_\_\_  
Work description.

**4. CONTRACTOR'S COMMITMENT TO USE DBE FIRM** Prime contractor fills out.

\_\_\_\_\_ is committed to utilize the DBE contractor to  
(Name of Contractor)

utilize the above named DBE subcontractor/supplier in the manner and amount described on this form.

Dated \_\_\_\_\_  
(Authorized Signature)

**5. DBE'S COMMITMENT TO PARTICIPATE** Sub contractor fills out.

\_\_\_\_\_ as a DBE firm, is committed to perform the  
(Name of subcontractor/supplier)

work as described above for the amount specified.

Dated \_\_\_\_\_  
(Authorized Signature)

**6. NO SUBCONTRACT OPPORTUNITIES, AVAILABLE.** Prime contractor fills out.

\_\_\_\_\_, has no subcontractor opportunities  
(Name of subcontractor/supplier)

available for work to be performed.

Dated \_\_\_\_\_  
(Authorized Signature)

**DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS**

As required by U.S. Department of Transportation regulations on Government and Suspension at 49 CFR 29.510, the Contractor certifies to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (2) Have not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) transaction or contract under a public transaction; violation of Federal or state anti-trust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
- (3) Are not presently indicted or otherwise criminally or civilly charged by a government entity (Federal, state, or local) with the commission of any of the offenses listed in paragraph (2) of this certification.
- (4) Have not within a three-year period preceding this contract had one or more public transactions (Federal, state, or local) terminated for cause of default.

The contractor certifies that if it becomes aware of any later information that contradicts the statements of paragraphs (1) through (4) above, it will promptly inform FTA. Should the contractor be unable to certify to the statements of paragraphs (1) through (4) above, it shall acknowledge on its signature page and provide a written explanation to FTA.

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Signature of Authorized Individual

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Title

The certification must be attached and returned with any bid equal to or exceeding \$25,000.



**CERTIFICATION OF COMPLIANCE WITH FEDERAL CONTRACT CLAUSES**

As required by Federal Transit Administration Circular FTA C 4220.1F Third Party Contracting Guidance, Rev. 4, March 18, 2013, and all subsequent editions, as available on FTA’s website, [www.fta.dot.gov](http://www.fta.dot.gov) and <http://www.KMTS.org/about-metro/purchasing-info>

\_\_\_\_\_ acknowledges receipt of the Contract Clauses available  
(Vendor Name)

at <http://www.KMTS.org/about-metro/purchasing-info> and certifies compliance with all federal requirements for items and services being purchased by the CCTA.

\_\_\_\_\_  
VENDOR REPRESENTATIVE, TITLE

\_\_\_\_\_  
SIGNATURE (Vendor Representative)

\_\_\_\_\_  
Date

**BIDDERS QUESTIONNAIRE**

Please answer the following questions completely on this form.

1. Firm name: \_\_\_\_\_

2. Address and telephone number:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Established:        Year \_\_\_\_\_        State \_\_\_\_\_

4. Type of organization:  
    a. Individual: \_\_\_\_\_        b. Partnership: \_\_\_\_\_  
    c. Corporation: \_\_\_\_\_        d. Other: \_\_\_\_\_

5. State time frame from contract award to when the repairs will begin:  
\_\_\_\_\_  
\_\_\_\_\_

6. State length of time the refresh repairs will be under warranty:  
\_\_\_\_\_  
\_\_\_\_\_

7. Warranty Service will be provided by:  
Name and Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_

8. Provide three current references.  
Agency Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person/Title: \_\_\_\_\_  
Phone Number: \_\_\_\_\_  
Type of Service Provided: \_\_\_\_\_

**BIDDER’S QUESTIONNAIRE, continued.**

Agency Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person/Title: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Type of Service Provided: \_\_\_\_\_

Agency Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person/Title: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Type of Service Provided: \_\_\_\_\_

9. State any deviations from the specifications listed under Section III, Specifications.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that all of the information provided is true and answered to the best of my ability.

Signed: \_\_\_\_\_ Name: \_\_\_\_\_  
Type or Print

Title: \_\_\_\_\_ Date: \_\_\_\_\_

*NOTE: This blanket addendum is for informational purposes only and does not need to be acknowledged by bidders in their submission.*

**COVID-19 ADDENDUM #2**

January 1, 2022

**TO: ALL Prospective Bidders**  
**PROJECT: ALL Upcoming Projects**

The purpose of this addendum is to clarify and/or modify the sealed bid delivery and bid opening process for all upcoming projects. All work affected is subject to all applicable terms and conditions of the Bidding and Contract Documents.

**1. UPDATE TO SEALED BID DELIVERY AND BID OPENING POLICY:**

**Effective immediately and continuing until further notice, the City of Kalamazoo will return to IN-PERSON bid openings following City Hall guidelines, including Mask Mandate.**

**BIDS MUST BE RECEIVED BEFORE THE DUE DATE AND TIME – LATE BIDS WILL NOT BE CONSIDERED.**

**Bidders can submit sealed bids in one of the following ways:**

- **Mail your bid**, to be received before the bid due date and time indicated in the bid document, to the City of Kalamazoo at the following address:

City of Kalamazoo  
Purchasing Division  
241 West South Street  
Kalamazoo, MI 49007

- **Deliver your bid to the Treasurer’s Office Payment Drop Box** located in the northwest corner of City Hall before the bid due date and time indicated in the bid document.
- **Deliver your bid to City Hall In Person** before the bid due date and time indicated in the bid document.

All bids shall be tightly sealed in an envelope plainly marked SEALED BID and identified by project name, bid opening date and time. Bids opened by mistake, due to improper identification, will be so documented and resealed. The Purchasing Division will maintain and guarantee confidentiality of the contents until the specified opening date and time. Bids submitted by fax machine or email will not be accepted.

The Purchasing Division will post bid tabulations to the City of Kalamazoo website within 24 hours after the bid opening date and time at: <https://www.kalamazoocity.org/bidopportunities>.

Questions regarding this sealed bid delivery and bid opening policy change related to the COVID-19 virus should be directed to the City of Kalamazoo at (269) 337-8020.

Sincerely,



Michelle Emig  
Purchasing Division Manager

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have the authority to submit this bid which will become a binding contract if accepted by the CCTA. I hereby state that I have not communicated with nor otherwise colluded with any other bidder, nor have I made any agreement with nor offered/accepted anything of value to/from an official or employee of the CCTA that would tend to destroy or hinder free competition.

The firm's identification information provided will be used by the CCTA for purchase orders, payment and other contractual purposes. If the contractual relationship is with, or the payment made to, another firm please provide a complete explanation on your letterhead and attach to your bid. Please provide for accounts payable purposes:

Tax Identification Number (Federal ID): \_\_\_\_\_

Remittance Address: \_\_\_\_\_

I hereby state that I have read, understand and agree to be bound by all terms and conditions of this bid document.

SIGNED: \_\_\_\_\_ NAME: \_\_\_\_\_  
(Type or Print)

TITLE: \_\_\_\_\_ DATE: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_  
(if any)

ADDRESS: \_\_\_\_\_  
(Street address) (City) (State) (Zip)

PHONE: \_\_\_\_\_ FAX NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

**FOR CCTA USE ONLY - DO NOT WRITE BELOW**

### **SECTION III SCOPE /SPECIFICATONS AND REQUIREMENTS**

#### **1. SCOPE AND SPECIFICATIONS**

This project involves insulating the existing attic of the historic train & bus depot building located at 459 North Burdick Street, Kalamazoo, MI.

The scope of work includes applying a minimum of two inches (2”) of closed-cell spray on foam insulation between roof rafters and covering unused louvers as indicated on the plans. The installation of two new mini-split mechanical units in the attic space and a wall mounted condensing unit as shown on the drawings. All mechanical and electrical devices, including mechanical units and electrical panels, shall be protected during the performance of the scope of work.

A high-definition laser scan of the attic space can be accessed by prospective bidders by following this link:

<https://wightman.truview-cloud.com/site/627a623ed8fb6c0013edc76b?tab=sitemap>

The northeastern bus parking space will be made available for delivering equipment and staging workers.

#### **2. TIMELINE**

It is requested that the project shall be completed within **240 days** after the notice to proceed. However, due to the global supply chain constraints, this may be extended upon proof that the specified (or Owner approved equal) equipment is delayed. The contractor will continue to update the CCTA of any equipment delays.

#### **3. DBE CONTRACTOR COMPLIANCE**

- 3.1 The selected Contractor and its subcontractors shall agree to ensure that disadvantaged businesses have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with federal funds provided under this Agreement. In that regard, all Contractors and subcontractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 23 as amended, to ensure that minority business enterprises have the maximum opportunity to compete for and perform contracts.
- 3.2 Where the Contractor is found to have failed to exert sufficient reasonable and good faith efforts to involved DBEs in the work provided, Kalamazoo Metro Transit may declare the Contractor noncompliant and in breach of contract.
- 3.3 The Contractor shall keep records and documents for a reasonable time following performance of this contract to indicate compliance with Kalamazoo Metro Transit’s DBE program. These records and documents will be made available at reasonable times and placed for inspection by an authorized representative of Kalamazoo Metro Transit and will be submitted to Kalamazoo Metro Transit upon request.

**DBE CONTRACTOR COMPLIANCE (cont.)**

- 3.4 The contractor, sub-recipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.
- 3.5 The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than thirty (30) days from the receipt of each payment the prime contract receives from CCTA. The prime contractor agrees further to return retainage payments to each subcontractor within thirty (30) days after the subcontractors work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the CCTA. This clause applies to both DBE and non-DBE subcontracts. Non-compliance with this clause will be considered default under the contract.

**4. POST DUE DATE INFORMATION**

After receiving bids the CCTA may request further information or clarification in selected areas. Requested information shall be provided by the proposer either in writing or by oral presentations at no additional cost to the CCTA.

**5. TERMS AND CONDITIONS**

The CCTA standard Terms and Conditions in Section V, which will become a part of the Invitation for bid, are attached for your information. It is expected that these terms and conditions will form any contract resulting from this Invitation for Bid. If any additional terms and conditions are proposed, they shall be submitted with the bid and will be considered during the selection process.

**6. PRE-BID MEETING**

A non-mandatory pre-bid meeting has been scheduled for Monday, October 24, 2022, at 10:00 a.m. local time. Prospective bidders will meet at CCTA Building, 530 North Rose Street, Kalamazoo, in the main conference room and a tour of the attic will be included following a brief introduction.

**7. QUESTIONS**

Questions relative to the scope of work shall be addressed to Rob Branch, Deputy Director of Fleet and Facilities, at (269) 337-8235 or [branchr@kmetro.com](mailto:branchr@kmetro.com). Questions relative to the submission requirements may be addressed to Gracia Mason, Buyer, at (269) 337-8720 or [masong@kalamazoocity.org](mailto:masong@kalamazoocity.org).

#### SECTION IV INDEMNITY AND INSURANCE

Contractor, or any of their subcontractors, shall not commence work under this contract until they have obtained the insurance required under this paragraph, and shall keep such insurance in force during the entire life of this contract. All coverage shall be with insurance companies licensed and admitted to do business in the State of Michigan with a rating of A- or better from the A.M. Best Company. All coverage shall be with insurance carriers acceptable to the CCTA and be furnished within ten (10) days of Notice of Award.

The Contractor shall procure and maintain the following insurance coverage:

Workers' Compensation Insurance including Employers' Liability Coverage, in accordance with all applicable statutes of the State of Michigan.

Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$1,000,000 per occurrence and aggregate. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent, if not already included and (E) XCU coverage if the nature of the contract requires XC or U work.

Automobile Liability including Michigan No-Fault Coverages, with limits of liability not less than \$1,000,000 per occurrence, combined single limit for Bodily Injury, and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles, and all hired vehicles.

Additional Insured: Commercial General Liability and Automobile Liability, as described above, shall include an endorsement stating that the following shall be *Additional Insureds*: The CCTA, all elected and appointed officials, all employees and volunteers, all boards, commissions, and/or authorities and board members, including employees and volunteers thereof. It is understood and agreed that by naming the CCTA as additional insured, coverage afforded is considered to be primary and any other insurance the CCTA may have in effect shall be considered secondary and/or excess.

To the fullest extent permitted by law the Contractor agrees to defend, pay on behalf of, indemnify, and hold harmless the CCTA, its elected and appointed officials, employees, agents and volunteers, and others working on behalf of the CCTA against any and all claims, demands, suits, or loss, including all costs connected therewith, and for any damages which may be asserted, claimed, or recovered against or from the CCTA, by reason of personal injury, including bodily injury or death and/or property damage, including loss of use thereof, which arises out of, or is in any way connected or associated with this contract.

Cancellation Notice: All policies, as described above, shall include an endorsement stating that it is understood and agreed that thirty (30) days, or ten (10) days for non-payment of premium, Advance Written Notice of Cancellation, Non-Renewal, Reduction, and/or Material Change shall be sent to: CCTA, Purchasing Department, 241 W. South Street, Kalamazoo, MI 49007.



**INDEMNITY AND INSURANCE**  
***CONTINUED***

Proof of Insurance Coverage: The Contractor shall provide the CCTA, at the time that the contracts are returned to the CCTA for execution, a copy of Certificates of Insurance as well as required endorsements. In lieu of required endorsements, if applicable, a copy of the policy sections where coverage is provided for additional insured and cancellation notice would be acceptable. Copies or certified copies of all policies mentioned above shall be furnished, if so requested for all coverage as listed above or within 10 days of Notice of Award.

If any of the above coverages expire during the term of this contract, the Contractor shall deliver renewal certificates and/or policies to CCTA at least ten (10) days prior to the expiration date.

Scope of Coverage: The above requirements and conditions shall not be interpreted to limit the liability of the Contractor under this Contract, but shall be interpreted to provide the greatest benefit to the CCTA and its officers and employees. The above listed coverages shall protect the Contractor, its employees, agents, representatives and subcontractors against claims arising out of the work performed. It shall be the Contractor's responsibility to provide similar insurance for each subcontractor or to provide evidence that each subcontractor carries such insurance in like amount prior to the time such subcontractor proceeds to perform under the contract.

**SECTION V  
TERMS AND CONDITIONS**

**1. AWARD OF CONTRACT**

- A. The contract will be awarded to that responsible proposer whose bid, conforming to this solicitation, will be most advantageous to the CCTA according to the criteria outlined herein. The CCTA reserves the right to accept or reject any or all bids and waive informalities and minor irregularities in bids received. The award of this Contract shall be in its entirety to the Proposer determined to be most responsive and responsible.
- B. Notification of award will be in writing by the Purchasing Manager. Upon notification, the Consultant/ Professional Firm (hereinafter Firm) shall submit to the Purchasing Division all required insurance certificates (if required) and such other documentation as may be requested or required hereunder. Upon their receipt and subsequent approval by the CCTA, the Purchasing Manager will forward to the Firm a written **NOTICE TO PROCEED**. Work shall **NOT** be started until such **NOTICE TO PROCEED** is received by the Firm.
- C. Unilateral changes in bid prices by the proposer shall not be allowed. However, the CCTA, at its sole option, reserves the right to negotiate with proposers.

**2. INVITATION FOR BID AS CONTRACT**

Should modifications (after bid opening) NOT be necessary; this Invitation for Bid (IFB) will be executed as the contract. In the event modifications of any nature do occur, a separate agreement shall be negotiated containing mutually agreeable terms and conditions from this Invitation for Bids and any addenda.

**3. SUBCONTRACTORS - NON ASSIGNMENT**

Proposers shall state in writing any and all sub-contractors to be associated with this bid, including the type of work to be performed. The Firm shall cooperate with the CCTA in meeting its commitments and goals with regard to maximum utilization of minority and women-owned business enterprises.

The Firm hereby agrees and understands that the contract resulting from this bid shall not be transferred, assigned or sublet without prior written consent of the CCTA.

**4. TAXES**

The CCTA is exempt from all federal excise tax and state sales and use taxes. However, depending upon the situation, the vendor or Firm may not be exempt from said taxes and the CCTA is making no representation as to any such exemption.

**5. PAYMENTS**

Unless otherwise specified by the CCTA in this bid, the Firm will be paid in not more than thirty (30) days after receipt of a properly executed invoice, the sum stipulated herein for service rendered and accepted. Payments are processed by the Budget and Accounting Division after receipt of an original invoice from the Firm and approval by the department.

## 6. CHANGES AND/OR CONTRACT MODIFICATIONS

The CCTA reserves the right to increase or decrease services or requirements, or make any changes necessary at any time during the term of this contract, or any negotiated extension thereof. Price adjustments due to any of the foregoing changes shall be negotiated and mutually agreed upon by the Firm and the CCTA.

Changes of any nature after contract award which reflect an increase or decrease in requirements or costs shall not be permitted without prior approval by the Purchasing Manager. CCTA Commission approval may also be required. **SUCH CHANGES, IF PERFORMED IN ADVANCE OF PURCHASING MANAGER APPROVAL, MAY BE SUBJECT TO DENIAL AND NON-PAYMENT.**

## 7. LAWS, ORDINANCES AND REGULATIONS

The Firm shall keep themselves fully informed of all local, state and federal laws, ordinances and regulations in any manner affecting those engaged or employed in the work and the equipment used. The Firm and/or employees shall, at all times, serve and comply with such laws, ordinances and regulations.

Any permits, licenses, certificates or fees required for the performance of the work shall be obtained and paid for by the Firm.

This contract shall be governed by the laws of the State of Michigan.

## 8. RIGHT TO AUDIT

The CCTA or its designee shall be entitled to audit all of the Firm's records, and shall be allowed to interview any of the Firm's employees, throughout the term of this contract and for a period of three years after final payment or longer if required by law to the extent necessary to adequately permit evaluation and verification of:

- A. Firm's compliance with contract requirements,
- B. Compliance with provisions for pricing change orders, invoices or claims submitted by the Firm or any of their payees.

## 9. HOLD HARMLESS

If the acts or omissions of the Contractor/Vendor or its employees, agents or officers, cause injury to person or property, the Contractor/Vendor shall defend, indemnify and save harmless the CCTA, its agents, officials, and employees against all claims, judgments, losses, damages, demands, and payments of any kind to persons or property to the extent occasioned from any claim or demand arising therefrom.

## 10. DEFAULT

The CCTA may at any time, by written notice to the Firm, terminate this contract and the Firm's right to proceed with the work, for just cause, which shall include, but is not limited to the following:

- A. Failure to provide insurance and bonds (when called for), in the exact amounts and within the time specified or any extension thereof.
- B. Failure to perform the services within the time specified herein, or any extension thereof.
- C. Failure to make progress if such failure endangers performance of the contract in accordance with its terms.
- D. Failure to perform in compliance with any provision of the contract.
- E. **Standard of Performance** - Firm guarantees to perform the services rendered herein in accordance with the accepted standards of the industry or industries concerned herein, except that if the specifications call for higher standards, then such higher standards shall be provided.

Upon notice by the CCTA of the Firm's failure to comply with such standards or to otherwise be in default of this contract in any manner following the Notice to Proceed, the Firm shall immediately remedy said defective performance in a manner acceptable to the CCTA. Should the Firm fail to immediately correct said defective performance, said failure shall be considered a breach of this contract and grounds for termination of the same by the CCTA.

In the event of any breach of this contract by the Firm, the Firm shall pay any cost to the CCTA caused by said breach including but not limited to the replacement cost of such services with another Firm.

The CCTA reserves the right to withhold any or all payments until any defects in performance have been satisfactorily corrected.

In the event the Firm is in breach of this contract in any manner, and such breach has not been satisfactorily corrected, the CCTA may bar the Firm from being awarded any future CCTA contracts.

- F. All remedies available to the CCTA herein are cumulative and the election of one remedy by the CCTA shall not be a waiver of any other remedy available to the CCTA, either listed in this contract or available by operation of law.

## 11. INDEPENDENT

At all times the Firm, any of its employees, or its sub-contractors, and their subsequent employees **CONTRACTOR** shall be considered independent contractors and not as CCTA employees. The Contractor shall exercise all supervisory control and general control over all workers' duties, payment of wages to Contractor's employees and the right to hire, fire and discipline their employees and workers. As an independent contractor, payment under this contract shall not be subject to any withholding for tax, social security or other purposes, nor shall the Contractor or its employees be entitled to CCTA paid sick leave, pension benefit, vacation, medical benefits, life insurance or workers' unemployment compensation or the like.

**12. CCTA'S RESPONSIBILITIES**

The CCTA agrees to provide full, reliable information regarding its requirements for the Project and, at its expense, shall furnish the information, surveys and reports, if any, as described in the specifications. In addition, the CCTA agrees to provide, at its expense and in a timely manner, the cooperation of its personnel and such additional information with respect to the Project as may be required from time to time, to be provided by the CCTA for the performance of the Firm's work.

**13. TERMINATION**

This Agreement may be terminated by either the CCTA or the Firm by giving written notice at least thirty (30) days prior to the date of termination.

- A. In the event of such termination by the Firm, the CCTA, together with any other remedies which are legally available, may withhold any subsequent payment due under this agreement until such time as the services required to be performed under this Agreement have been completed by the CCTA or another firm. In the event that the CCTA incurs additional expenses caused directly or indirectly by the termination of this Agreement, together with such other remedies as are legally available, the CCTA shall be entitled to deduct such expenses from any unpaid amount due to the Firm under this agreement.
- B. In the event of such termination by the CCTA, the CCTA shall pay the Firm for services and reimbursable expenses performed or incurred prior to the termination date plus all costs and expenses directly attributable to such termination for which the Firm is not otherwise compensated.

**14. NO WAIVER**

Either party's failure to insist on strict performance of any term or condition of the contract shall not be deemed a waiver of that term or condition even if the party accepting or acquiescing in the nonconforming performance knows of the nature of the performance and fails to object to it.

**APPENDIX A**  
**NON-DISCRIMINATION CLAUSE FOR ALL CCTA CONTRACTS**

The Contractor agrees to comply with the Federal Civil Rights Act of 1964 as amended; the Federal Civil Rights Act of 1991 as amended; the Americans With Disabilities Act of 1990 as amended; the Elliott-Larson Civil Rights Act, Act. No. 453, Public Act of 1976 as amended; the Michigan Handicappers Civil Rights Act, Act No. 220, Public Act of 1976 as amended, City Ordinance 1856 and all other applicable Federal and State laws. The Contractor agrees as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, age, height, weight, marital status, physical or mental disability, family status, sexual orientation or gender identity that is unrelated to the individual's ability to perform the duties of the particular job or position. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment advertising, layoff or termination; rates of pay or other forms of compensations; and selection for training, including apprenticeship.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, sex, age, height, weight, marital status, physical or mental disability family status, sexual orientation or gender identity that is unrelated to the individuals ability to perform the duties of the particular job or position.
3. If requested by the CCTA, the Contractor shall furnish information regarding practices, policies and programs and employment statistics for the Contractor and subcontractors. The Contractor and subcontractors shall permit access to all books, records and accounts regarding employment practices by agents and representatives of the CCTA duly charged with investigative duties to assure compliance with this clause.
4. Breach of the covenants herein may be regarded as a material breach of the contract or purchasing agreement as provided in the Elliott-Larsen Civil Rights Act and City Ordinance 1856.
5. The Contractor will include or incorporate by reference the provisions of the foregoing paragraphs 1 through 4 in every subcontract or purchase order unless exempted by the rules, regulations or orders of the Michigan Civil Rights Commission\* and will provide in every subcontract or purchase order that said provision will be binding upon each subcontractor or seller.
6. The Contractor will not preclude a person with a criminal conviction from being considered for employment unless otherwise precluded by federal or state law. (for contracts over \$25,000)

The Elliott-Larson Civil Rights Act, Sec. 202 of Act. No. 453 of 1976 reads in part as follows:

Sec. 202. (1) An employer shall not:

- (a) Fail or refuse to hire, or recruit, or discharge or otherwise discriminate against an individual with respect to employment, compensation, or a term condition or privilege of employment because of religion, race, color, national origin, age, sex, height, weight or marital status.
- (b) Limit, segregate or classify an employee or applicant for employment in a way which deprives or tends to deprive the employee or applicant of an employment opportunity or otherwise adversely affects the status of an employee or applicant because of religion, race, color, national origin, age, sex, height, weight or marital status.
- (c) Segregate, classify or otherwise discriminate against a person on the basis of sex with respect to a term, condition or privilege of employment, including a benefit plan or system.

\* Except for contracts entered into with parties employing less than three employees.



## **FTA REQUIREMENTS**

**Bid Ref #: 91038-011.0**

**APPENDIX A-1  
NONDISCRIMINATION**

During the performance of this contract, the contractor agrees as follows:

- (1) Nondiscrimination – in accordance with Title VI of the Civil Rights Act, as amended, 42 USC subsection 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 USC subsection 6102, section 202 of the Americans with Disabilities Act of 1990, 42 USC subsection 12132, and Federal transit law at 49 USC subsection 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.
- (2) Equal Employment Opportunity – The following equal employment opportunity requirements apply to the underlying contract:
  - a. Race, Color, Creed, National Origin, Sec - In accordance with Title VII of the Civil Rights Act, as amended, 42 USC subsection 2000e and Federal transit laws at 49 USC subsection 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of the Department of Labor (USDOL) regulations. “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.” 41 CFR Parts 60 et seq., (which implement Executive Order No. 11246, “Equal Employment Opportunity,” as amended by Executive Order No. 11375,” Amending Executive Order 11246 Relating to Equal Employment Opportunity,” 42 USC subsection 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are tested during employment, without regard to their race, color, creed, national origin, sex or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection of training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
  - b. Age – In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 USC subsections 623 and Federal transit law at 49 USC subsection 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
  - c. Disabilities – In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 USC subsection 12112, the Contractor agrees that it will comply with the requirements of the US Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements the FTA may issue.
- (3) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.



**APPENDIX B-1**  
**APPLICATION OF FEDERAL TRANSIT ADMINISTRATION**  
**REGULATIONS AND REQUIREMENTS**

To achieve compliance with changing Federal requirements, the City of Kalamazoo hereby includes notice that Federal requirements may change and the changed requirements will apply to this contract, as applicable, unless the Federal government determines otherwise.

The contractor also recognizes that the United States Environmental Protection Agency, Federal Highway Administration, and other agencies in the Federal Government have issued and are expected to issue regulations, guidelines, orders, or other requirements that may affect this contract. The Contractor acknowledges that other obligations relative to this contract involving Federal law may exist.

The City of Kalamazoo has agreed to include provision adequate to ensure compliance of participation entities with Federal requirements. The contractor agrees to include in its subcontracts for service under this contract provisions adequate to impose Federal requirements including those below:

**For all Contracts:**

**NOTICE OF FEDERAL REQUIREMENTS:** The contractor shall comply with the rules of 49 CFR Part 18, relative to third party contracts with the City of Kalamazoo, Uniform Administrative Requirements for Grants and Cooperative Agreements.

**INTEREST OF MEMBERS OR DELEGATES TO CONGRESS:** No member or delegate to the Congress of the United States shall be admitted to any share or part of this project or any benefit therefrom.

**ENERGY CONSERVATION REQUIREMENTS:** The contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

**ACCESS TO RECORDS** (sole source or offer): The contractor agrees to provide the Metro Transit system, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions. Contractor also agrees, pursuant to 49 C.F.R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309, or 5311. The contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed. The Contractor agrees to maintain all books, records, accounts, and reports required under this contract for a period of not less than three years, after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case contractor agrees to maintain same until the Metro Transit System, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims, or exceptions related thereto. Reference 49 CFR 18.39(I)(11).

**CONTRACTS INVOLVING FEDERAL PRIVACY ACT REQUIREMENTS** (applies to the contractor and its employees that administer any system of records on behalf of the Federal Government under any contract. Specific attention is drawn to contractors administering drug and alcohol enforcement activities for FTA): (1) The contractor agrees to comply with, and assures the compliance of its employees with, the information restrictions and other applicable requirements of the Privacy Act of 1974, 5 U.S.C. subsection 552a. Among other things, the contractor agrees to obtain the express consent of the Federal Government before the contractor or its employees operate a system of records on behalf of the Federal Government. The contractor understands that the requirements of the Privacy Act, including the civil and criminal penalties for violation of that Act, apply to those individuals involved, and that failure to comply with the terms of the Privacy Act may result in termination of the underlying contract. (2) The contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

**FEDERAL CHANGES:** Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Agreement (Form FTA MA (2) dated October, 1999) between the Metro Transit System, and the FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

**RECOVERED MATERIALS:** The contractor agrees to comply with all the requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designed in Subpart B of 40 CFR Part 247.

**NO OBLIGATIONS BY THE FEDERAL GOVERNMENT:** (1) The Metro Transit System and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government or in approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Purchaser, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract. (2) The contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

**INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS:** These provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1D, dated April 15, 1996, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any Kalamazoo Metro Transit requests which would cause Kalamazoo Metro Transit to be in violation of the FTA terms and conditions.

**PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS:** (1) The contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. subsection 3801 et seq. And U.S. DOT regulations, Program Fraud Civil Remedies, 49 CFR Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assistance project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made a false, fictitious, or fraudulent claim, statement, submission, or certification, the

Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate. (2) The contractor also acknowledges that if it makes or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. subsection 5307, the Government reserves the right to impose the penalties of 18 U.S.C. subsection 1001 and 49 U.S.C. subsection 5307(n)(1) on the contractor, to the extent the Federal Government deems appropriate. (3) The contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by the FTA. It is further agreed that the clauses shall not be modified, except to identify the contractor who will be subject to the provisions.

**DISADVANTAGED BUSINESS ENTERPRISE PROVISION:** The Federal Fiscal Year goal has been set by Kalamazoo Metro Transit in an attempt to match projected procurements with available qualified disadvantaged businesses. Kalamazoo Metro Transit goals for budgeted service contracts, bus parts, and other material and supplies for Disadvantaged Business Enterprises have been established by Kalamazoo Metro Transit as set forth by the Department of Transportation Regulations 49 C.F.R. Part 23, March 31, 1980, and amended by Section 106(c) of the Surface Transportation Assistance Act of 1987, and is considered pertinent to any contract resulting from this solicitation.

- (1) Policy. It is the policy of the Department of Transportation and Kalamazoo Metro Transit that Disadvantaged Business Enterprises, as defined in 49 CFR Part 23, and as amended in Section 106(c) of the Surface Transportation and Uniform Relocation Assistance Act of 1987, shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with federal funds under this Agreement. Consequently, the DBE requirements of 49 CFR Part 23 and Section 106(c) of the STURRA of 1987, apply to this contract.

The Contractor agrees to ensure that DBEs as defined in 49 CFR Part 23 and Section 106(c) of the STURAA of 1987 have the maximum opportunity to participate in the whole or in part with federal funds provided under this Agreement. In this regard, the Contractor shall take all necessary and reasonable steps in accordance with the regulations to ensure that DBEs have the maximum opportunity to compete for and perform subcontracts. The contractor shall not discriminate on the basis of race, color, national origin, religion, sex, age, or physical handicap in the award and performance of subcontracts. It is further the policy of Kalamazoo metro Transit to promote the development and increase the participation of businesses owned and controlled by disadvantaged individuals. DBE involvement in all phases of Kalamazoo Metro Transit procurement activities are encouraged.

- (2) DBE obligation. The contractor and its subcontractors agree to ensure that disadvantaged businesses have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with federal funds provided under this Agreement. In that regard, all Contractors and subcontractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 23 as amended, to ensure that minority business enterprises have the maximum opportunity to compete for and perform contracts.
- (3) Where the contractor is found to have failed to exert sufficient reasonable and good faith efforts to involved DBEs in the work provided, Kalamazoo Metro Transit may declare the contractor noncompliant and in breach of contract.

- (4) The contractor will keep records and documents for a reasonable time following performance of this contract to indicate compliance with Kalamazoo Metro Transit's DBE program. These records and documents will be made available at reasonable times and placed for inspection by an authorized representative of Kalamazoo Metro Transit and will be submitted to Kalamazoo Metro Transit upon request.
- (5) Kalamazoo Metro Transit will provide affirmative assistance as may be reasonable and necessary to assist the prime contractor in implementing their programs for DBE participation. The assistance may include the following upon request: identification of a qualified DBE; available listing of minority assistance agencies; holding bid conferences to emphasize requirements.
- (6) Definitions:
- X Disadvantaged business: A small business concern which is at least 51 percent owned by one or more socially and economically disadvantaged individuals, or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more socially and economically disadvantaged individuals; and whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it - OR - Which is at least 51 percent owned by one or more women, or in the case of public owned business, at least 51 percent of the stock of which is owned by one or more women; and, whose management and daily business operations are controlled by one or more women who own it.
  - X Small Business Concern: A small business, as defined by Section 3 of the Small Business Act and Appendix B - (Section 106(c)) Determinations of Business Size.
  - X Socially and economically disadvantaged individuals: Those individuals who are citizens of the United States or lawfully admitted permanent residents and who are black Americans, Hispanic Americans, native Americans, Asian-Pacific Americans, Asian-Indian Americans, or women, or any other minorities or individuals found to be disadvantaged by the Small Business Administration pursuant to section 8(a) of the Small Business Act. Black Americans includes persons having origins in any of the Black racial groups of Africa; Hispanic Americans includes persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race; Native Americans includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians; Asian-Pacific Americans includes persons whose origins are from Japan, China, Taiwan, Korea, Vietnam, Laos, Cambodia, the Philippines, Samoa, Guam, the U.S. Trust Territories of the Pacific, and the Northern Marianas; Asian-Indian Americans includes persons whose origins are from India, Pakistan, and Bangladesh.

**TRANSIT EMPLOYEE PROTECTIVE PROVISIONS:** (1) The contractor agrees to comply with applicable transit employee protective requirements, as follows: (a) General Transit Employee Protective Requirements. To the extent that FTA determines that transit operations are involved, the contractor agrees to carry out the transit operations work on the underlying contract in compliance with terms and conditions determined by the U.S. Secretary of Labor to be fair and equitable to protect the interests of employees employed under this contract and to meet the employee protective requirements of 49 U.S.C. subsection 5333(b), and U.S. DOL guidelines at 29 CFR Part 215, and any amendments thereto. These terms and conditions are identified in the letter of certification from the US DOL to FTA applicable to the FTA Recipient's project from which Federal assistance is provided to support work on the underlying contract. The Contractor agrees to carry out that work in compliance with the conditions stated in that US DOL letter. The requirements of this subsection (1), however, do not apply to any contract financed with Federal assistance provided by FTA either for projects for elderly

individuals and individuals with disabilities authorized by 49 U.S.C. subsection 5310(a)(2), or for projects for nonurbanized areas authorized by 49 U.S.C. subsection 5311. Alternate provisions for those projects are set forth in subsections (b) and (c) of this clause. (b) Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. subsection 5310(a)(2) for Elderly Individuals and Individuals with Disabilities. If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. subsection 5310(a)(2), and if the US Secretary of Transportation has determined or determines in the future that the employee protective requirements of 49 U.S.C. subsection 5333(b) are necessary or appropriate for the state and the public body subrecipient for which work is performed on the underlying contract, the contractor agrees to carry out the Project in compliance with the terms and conditions determined by the U.S. Secretary of Labor to meet the requirements of 49 U.S.C. subsection 5333(b), US DOL guidelines at 29 CFR Part 215, and any amendments thereto. These terms and conditions are identified in the US DOL's letter of certification to FTA, the date of which is set forth Grant Agreement or Cooperative Agreement with the state. The contractor agrees to perform transit operations in connection with the underlying contract in compliance with the conditions stated in that US DOL letter. (c) Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. subsection 5311 in Nonurbanized areas. If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. subsection 5311, the contractor agrees to comply with the terms and conditions of the Special Warranty for the Nonurbanized Area Program agreed to by the US Secretaries of Transportation and Labor, dated May 31, 1979, and the procedures implements by US DOL or any revision thereto. (2) The contractor also agrees to include any applicable requirements in each subcontract involving transit operations financed in whole or in part with Federal assistance provided by the FTA.

**ACCESS REQUIREMENTS FOR PERSONS WITH DISABILITIES:** The contractor agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA) as amended, 42 USC subsection 12101, et seq; Section 504 of the Rehabilitation Act of 1973, as amended, 29 USC, subsection 794, 49 USC subsection 5301(d), and the following Federal regulations, as they relate to this contract:

- (1) United States Department of Transportation regulations, Transportation Services for Individuals with Disabilities (ADA), 49 CFR Part 37.
- (2) United States Department of Transportation regulations, Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefitting from Federal Financial Assistance, 49 CFR Part 27.
- (3) United States Department of Transportation regulations, Americans with Disabilities Act (ADA) Accessibility Specifications for Transportation Vehicles, 49 CFR Part 38.
- (4) United States Department of Justice regulations, Nondiscrimination on the Basis of Disability in State and Local Government Services, 28 CFR Part 35.
- (5) United States Department of Justice regulations, Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, 28 CFR Part 36.
- (6) United States General Services Administration regulations Accommodations for the Physically Handicapped, 41 CFR Subparts 101-19.
- (7) United States Equal Employment Opportunity Commission, Regulations to Implement the Equal Employment Provisions of the ADA, 29 CFR Part 1630.

- (8) United States Federal Communications Commission regulations, Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled, 47 CFR Part 64, Subpart F.
- (9) Federal Transit Administration regulations, Transportation for Elderly and Handicapped Persons, 49 CFR Part 609.
- (10) Any implementing requirements FTA may issue.

**TERMINATION PROVISIONS** – If there is a conflict between the termination provisions of the terms and conditions and these FTA provisions, the FTA provisions prevail.

- a. Termination for Convenience – The City of Kalamazoo may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Government’s best interest. The Contractor shall be paid its costs, including contract close-outs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the City of Kalamazoo to be paid the Contractor. If the Contractor has any property in its possession belonging to the City of Kalamazoo, the Contractor will account for the same, and dispose of it in the manner the City of Kalamazoo directs.
- b. Termination for Default (Breach or Cause) – If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the City of Kalamazoo may terminate this contract for default. Termination shall be effective by serving a notice of termination on the contractor setting forth the manner in which the Contractor is in default. The contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.  
If it is later determined by the City of Kalamazoo that the Contractor had an excusable reason for not performing, such as strike, flood, events which are not the fault of or are beyond the control of the Contractor, the City of Kalamazoo, after setting up a new delivery of performance schedule, may allow the Contractor to continue work or treat the termination as a termination for convenience.
- c. Opportunity to Cure – The City of Kalamazoo in its sole discretion may, in the case of a termination for breach or default, allow the Contractor an appropriately short period of time in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions.  
If Contractor fails to remedy to the City of Kalamazoo’s satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within the established timeframe, the City of Kalamazoo shall have the right to terminate the Contract without any further obligation to the Contractor. Such termination for default shall not in any way operate to preclude the City of Kalamazoo from also pursuing all available remedies against the Contractor and its sureties for said breach or default.
- d. Waiver of Remedies for Any Breach – In the event that the City of Kalamazoo elects to waive its remedies for any breach by the Contractor of any covenant, term or condition of the Contract, such waiver by the City of Kalamazoo shall not limit the City of Kalamazoo’s remedies for any succeeding breach of that or of any other term, covenant or condition of this Contract.

**FLY AMERICA REQUIREMENTS** – The Contractor agrees to comply with 49 USC 40118 (the “Fly America” Act) in accordance with the General Services Administration’s regulations at 41 CFR Part 301-10, which provide the recipients and subrecipients of Federal funds and their contractors are required to use U.S. Flag air carriers for U.S. Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. Flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

**CARGO PREFERENCE REQUIREMENTS** - Use of United States Flag Vessels: (applies to anything transported by ocean vessels) The contractor agrees to a) use privately owned United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels; b) furnish within 20 working days following the date of loading for shipments originating within the United States, or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rates, on-board commercial ocean bill-of-lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the Metro Transit System; c) to include these requirements in all subcontracts issued pursuant to this contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

**For Operational Contracts (excluding transportation services) in excess of \$2,500; rolling stock contracts; and, construction contracts over \$2,000 (in conjunction with the Davis-Bacon Act clauses set forth below).**

**CONTRACT WORK HOURS AND SAFETY STANDARDS ACT:** Pursuant to Section 102 (Overtime):

- (1) **Overtime Requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) **Violation; liability for unpaid wages; liquidated damage.** In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- (3) **Withholding for unpaid wages and liquidated damages.** The Kalamazoo Metro Transit System shall upon its own action or upon written request for an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- (4) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in this section.
- (5) **Special Provision of Section 102 Nonconstruction Contracts: Payroll and basic records.** (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing



apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (6) **Section 107 (OSHA): (This section is applicable to construction contracts only) Contract Work Hours and Safety Standards Act -**
- (i) The Contractor agrees to comply with section 107 of the Contract Work Hours and Safety Standards Act, 40 USC section 333 and applicable DOL regulations. “Safety and Health Regulations for Construction” 29 CFR Part 1926. Among other things, the Contractor agrees that it will not require any laborer or mechanic to work in unsanitary, hazardous, or dangerous surroundings or working conditions.
  - (ii) Subcontracts – The Contractor also agrees to include the requirements of this section in each subcontract. The term “subcontract” under this section is considered to refer to a person who agrees to perform any part of the labor or material requirements of a contract for construction, alteration or repair. A person who undertakes to perform a portion of a contract involving the furnishing of supplies or materials will be considered a “subcontractor” under this section if the work in question involves the performance of construction work and is to be performed: (1) directly on or near the construction site, or (2) by the employer for a specific project on a customized basis. Thus, a supplier of materials which will become an integral part of the construction is a “subcontractor” if the supplier fabricates or assembles the goods or materials in question specifically for the construction project and the work involved may be said to be construction activity. If the goods or materials in question are ordinarily sold to other customers from regular inventory, the supplier is not a “subcontractor.” The requirements of this section do not apply to contracts or subcontracts for the purchase of supplies or materials or articles normally available on the open market.

**For Research Contracts:**

**PATENT AND RIGHTS IN DATA:** The following requirements apply to each contract involving experimental, developmental or research work:

- (1) The term “subject data” used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the contract. The term includes graphic or pictorial delineation in media such as drawings or photographs; text in specifications or related performance or design-type documents; machine forms such as punched cards, magnetic tape, or computer memory printouts; and information retained in computer memory. Examples include, but are not limited to: computer software, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term subject data does not include financial reports, cost analyses, and similar information incidental to contract administration.
- (2) The following restrictions apply to all subject data first produced in the performance of the contract to which this attachment has been added:
  - (a) Except for its own internal use, Kalamazoo Metro Transit or the contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may Kalamazoo Metro Transit or contractor authorize others to do so, without the written consent of the Federal Government, until such time as the Federal Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to any contract with an academic institution.
  - (b) In accordance with 49 CFR subsection 18.34 and 49 CFR subsection 19.36, the Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, for Federal Government purposes, any subject data or copyright described in subsections (2)(b)1 and (2)(b)2 of this clause below. As used in the previous sentence, for Federal Government purposes, means use only for the direct purposes of the Federal Government. Without the copyright owner’s consent, the Federal Government may not extend its Federal license to any other party.
    1. Any subject data developed under that contract, whether or not a copyright has been obtained; and
    2. Any rights of copyright purchase by Kalamazoo Metro Transit or contractor using Federal assistance in whole or in part provided by FTA.
  - (c) When FTA awards Federal assistance for experimental, developmental, or research work, it is FTA’s general intention to increase transportation knowledge available to the public, rather than to restrict the benefits resulting from the work to participants in that work. Therefore, unless FTA determines otherwise, Kalamazoo Metro Transit and the contractor performing experimental, developmental, or research work required by the underlying contract to which this Attachment is added agrees to permit FTA to make available to the public, either FTA’s license in the copyright to any subject data developed in the course of that contract, or a copy of the subject data first produced under the contract for which a copyright has not been obtained. If the experimental, developmental, or research work, which is the subject of the underlying contract, is not completed for any reason whatsoever, all data developed under that contract shall become subject data as defined in subsection (a) of this clause and shall be delivered as the Federal Government may direct. This subsection (c), however, does not apply to adaptation of automatic data processing equipment or programs for which Kalamazoo Metro Transit or the contractor’s use whose costs are financed in whole or in part with Federal assistance provided by FTA for transportation capital projects.

- (d) Unless prohibited by state law, upon request by the Federal Government, Kalamazoo Metro Transit and the contractor agree to indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by Kalamazoo Metro Transit or the contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under that contract. Neither Kalamazoo metro Transit nor the contractor shall be required to indemnify the Federal Government of any such liability arising out of the wrongful act of any employee, official, or agents of the Federal Government.
  - (e) Nothing contained in this clause on rights in data shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.
  - (f) Data developed by Kalamazoo Metro Transit or the contractor and financed entirely without using Federal assistance provided by the Federal Government that has been incorporated into work required by the underlying contract to which this Attachment has been added is exempt from the requirements of subsections (b), (c), and (d) of this clause, provided that Kalamazoo Metro Transit or the contractor identifies that data in writing at the time of delivery of the contract work.
  - (g) Unless FTA determines otherwise, the Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.
- (3) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (i.e., a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual, etc.), Kalamazoo metro Transit and the contractor agree to take the necessary actions to provide through FTA, those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements, 37 CFR Part 401.
- (4) The contractor also agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

**PATENT RIGHTS:** (1) General. If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under the contract to which this Attachment has been added, and that invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, Kalamazoo Metro Transit and the contractor agree to take actions necessary to provide immediate notice and a detailed report to the party at a higher tier until FTA is ultimately notified. (2) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (a large business, small business, state government, or state instrumentality, local government, nonprofit organization, institution of higher education, individual), Kalamazoo Metro Transit and the contractor agree to take the necessary actions to provide through FTA, those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts, and Cooperative Agreements, 37 CFR Part 401. (3) The contractor also agrees to include the requirements of this clause in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

**For Operational Service Contracts:**

**DRUG AND ALCOHOL TESTING:** (Maintenance contractors and subcontractors -- these rules do not apply): The contractor agrees to establish and implement a drug and alcohol testing program that complies with 49 CFR Parts 653 and 654, and permit any authorized representative of the United States Department of Transportation or its operating administrations, the Michigan Department of Transportation, or the Kalamazoo Metro Transit System to inspect the facilities and records associated with the implementation of the drug and alcohol testing program as required under 49 CFR Parts 653 and 654 and review the testing process. The contractor agrees further to certify annually its compliance with Parts 653 and 654 and to submit the Management Information System (MIS) reports before February 15th to the Metro Transit System Operations Supervisor. To certify compliance the contractor shall use the Substance Abuse Certifications in the Annual List of Certifications and Assurances for Federal Transit Administration Grants and Cooperative Agreements, which is published annually in the Federal Register.

**CHARTER BUS REQUIREMENTS:** The contractor agrees to comply with 49 U.S.C. 5323(d) and 49 CFR Part 604, which provides that recipients are subrecipients of FTA assistance are prohibited from providing charter service using federally funded equipment or facilities if there is at least one private charter operator willing and able to provide the service, except under one of the exceptions at 49 CFR 604.9. Any charter service provided under one of the exceptions must be incidental (i.e., must not interfere with or detract from the provision of mass transportation).

**SCHOOL BUS REQUIREMENTS:** Pursuant to 49 U.S.C. 5323(f) and 49 CFR Part 605, recipients and subrecipients of FTA assistance may not engage in school bus operations exclusively for the transportation of students and school personnel in competition with private school bus operators unless qualified under specified exemptions. When operating exclusive school bus service under an allowable exemption, recipients and subrecipients may not use federally funded equipment, vehicles, or facilities.

**Special Requirements for Construction Contracts**

**Prime Contractor Participation.** The prime contractor shall perform on the site with his own staff, work equivalent to at least ten percent of the total amount of construction work at the site. Only pay items of the construction contract will be used in computing the total amount of construction work at the site. The City may increase this minimum amount of prime contractor participation depending upon the degree of specialization or time to perform the work.

**Certified Payrolls Construction Project.** The City shall obtain from each contractor and subcontractor, a certified copy of each weekly payroll within seven days after the regular payroll date. Following a review by the City of compliance with State and Federal labor laws, the payroll copy shall be retained by the City for later review by FTA. A contractor may use the Department of Labor form WH-347, optional payroll form, which provides for all of the necessary payroll information and certifications. This Department of Labor form may be purchased at nominal cost from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. However, the contractor may use his own payroll form provided it includes the same information and certifications as the Department of Labor form WH-348 Statement of Compliance.

**Site Inspections.** The City shall have access to the site of construction and shall have the right to inspect all work.

**Project Signs.** The contractor shall erect at the site of construction, and maintain during construction, signs satisfactory to the Department of Transportation identifying the project and indicating that the Government is participating in the development of the project.

**Warranty of Construction.** For a period of one year from the date of completion as evidenced by the date of final acceptance of the work, the contractor warrants the work performed under this contract conforms to the contract requirements and is free of any defect of equipment, materials, or workmanship performed by the contractor or any other subcontractors or suppliers.

Under this warranty, the contractor shall remedy at his own expense any such failure to conform or any such defect. Nothing in the above intends or implies that this warranty shall apply to work which has been abused or neglected by the owner.

**Accessibility Requirements.** Construction projects shall comply with 41 CFR, Section 101-19.6, General Services Administration specifications on construction design for the physically disabled, and other mandates for accessibility as contained elsewhere in this specification or as may be implemented by the Federal Government.

**For Construction Contracts in Excess of \$2,000****DAVIS-BACON ACT****(1) Minimum wages.**

- (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers and mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill except as provided in 29 CFR part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- (ii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iii) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (iv) (A) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
  - (2) The classification is utilized in the area by the construction industry; and
  - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (1)(iv) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (2) **Withholding.** The City of Kalamazoo shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the City of Kalamazoo may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violation have ceased.

## (3) Payrolls and basic records.

- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated of the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii)
  - (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the City of Kalamazoo for transmission to the Federal Transit Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
  - (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of The persons employed under the contract and shall certify the following:
    - (1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR part 5 and that such information is correct and complete;
    - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3.



- (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the Statement of Compliance required by paragraph (3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal persecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Federal Transit Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.
- (4) **Apprentices and trainees**
  - (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe

benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division of the U.S. Department of Labor determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered as participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
  - (iii) Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.
- (5) **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.
- (6) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the Federal Transit Administration may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

- (7) **Contract termination:** debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees of their representatives.
- (10) **Certification of eligibility.** (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statement is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**For Contracts in Excess of \$100,000****BREACHES AND DISPUTE RESOLUTION:**

**DISPUTES:** Disputes arising in the performance of this contract which are not resolved by agreement of the parties shall be decided in writing by the authorized representative of the City of Kalamazoo. This decision shall be final and conclusive unless within ten (10) days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the City Manager. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the City Manager shall be binding upon the Contractor and the Contractor shall abide by the decision.

**PERFORMANCE DURING DISPUTE:** Unless otherwise directed by the City of Kalamazoo, the Contractor shall continue performance under this Contract while matters in dispute are being resolved.

**CLAIMS FOR DAMAGES:** Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of his/her employees, agent or others for who acts he/she is legally liable, a claim for damages therefore shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

**REMEDIES:** Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the City of Kalamazoo and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the City of Kalamazoo is located.

**RIGHTS AND REMEDIES:** The duties and obligations imposed by the contract documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the City of Kalamazoo, Architect or Engineer, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

**USE OF FACILITIES:** In contracts exceeding \$100,000, the use of facilities included on the EPA list of violating facilities is expressly prohibited, per the requirements contained at 49 CFR Part 15.

**CLEAN WATER REQUIREMENTS:** (1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will in turn report each violation as required to assure notification to FTA and the appropriate EPA Regional office. (2) The contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by the FTA.

**LOBBYING:** (Construction/A&E/Rolling Stock/Professional Service/Operational Service) Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the Metro Transit System.

**BUY AMERICA:** (Applicable to construction contracts; acquisition of goods or rolling stock (over \$100,000)): The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 CFR Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 CFR Part 661.7, and include final assembly in the United States for 15 passenger vans and 15 passenger wagons produced by Chrysler Corporation, microcomputer equipment, software, and small purchased (currently less than \$100,000) made with capital, operating, or planning funds. Separate requirements for rolling stock are set out at 5323(j)(2)(C) and 49 CFR 661.11. Rolling stock not subject to a general waiver must be manufactured in the United States and have a 60 percent domestic content.

A bidder or offeror must submit to the Metro Transit System the appropriate Buy America certificate with all bids on FTA-funded contracts, except those subject to a general waiver. Bids or offers that are not accompanied by a completed Buy America Certification must be rejected as non-responsive. The requirement does not apply to lower tier subcontractors.

**SEISMIC SAFETY (applies to buildings - new construction or additions):** The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in the Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract including work performed by a subcontractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

**CLEAN AIR:** (1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 41 U.S.C. subsections 7401 *et seq.* The contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will in turn report each violation as required to assure notification to FTA and the appropriate EPA Regional Office. (2) The contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

**For Contracts in Excess of \$25,000****CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS**

1. **By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.**
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Metro Transit System may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to Kalamazoo Metro Transit if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, persons, lower tier covered transaction, principal, proposal, and voluntarily excluded, as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact Kalamazoo Metro Transit for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction unless authorized in writing by Kalamazoo Metro Transit.
6. **The prospective lower tier participant further agrees by submitting this proposal that it will include the clause entitled Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion - Lower Tier Covered Transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.**
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determined the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List issued by U.S. General Service Administration.
8. Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under Paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, Kalamazoo Metro Transit may pursue available remedies including suspension and/or debarment.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Transactions**

- (1) The prospective lower tier participant certifies, by submission of this bid or proposal, that neither it nor its principals [as defined at 49 CFR subsection 29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
  
- (2) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**For Rolling Stock Procurement**

**BUS TESTING:** The contractor agrees to comply with 49 U.S.C., subsection 5323(c) and FTA's implementing regulation at 49 CFR Part 665 and shall perform the following: 1) a manufacturer of a new bus model or a bus produced with a major change in components or configuration shall provide a copy of the final test report to the recipient at a point in the procurement process specified by the recipient which will be prior to the recipient's final acceptance of the first vehicle. 2) A manufacturer who releases a report under paragraph 1 above shall provide notice to the operator of the testing facility that the report is available to the public. 3) If the manufacturer represents that the vehicle was previously tested, the vehicle being sold should have the identical configuration and major components as the vehicle in the test report, which must be provided to the recipient prior to recipient's final acceptance of the first vehicle. If the configuration or components are not identical, the manufacturer shall provide a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing. 4) If the manufacturer represents that the vehicle is grand fathered (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), the manufacturer shall provide the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.

**PRE-AWARD AND POST-DELIVERY AUDIT REQUIREMENTS:** The contractor agrees to comply with 49 U.S.C. subsection 5323(1) and FTA's implementing regulation at 49 CFR Part 663 and to submit the following certifications: 1) Buy America Requirements: The contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the Bidder/Offeror certifies compliance with Buy America, it shall submit documentation which lists 1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and 2) the location of the final assembly point for the rolling stock, including a description of activities that will take place at the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly. (2) Solicitation Specification Requirements: The contractor shall submit evidence that it will be capable of meeting the bid specifications. (3) Federal Motor Vehicle Safety Standards (FMVSS): The contractor shall submit 1) manufacturer's FMVSS self-certification sticker information that the vehicle complies with relevant FMVSS or 2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

**Special Requirements for Vehicle Acquisition**

**Buy America.** In accordance with 49 CFR Part 661.13, the attached certification shall be completed and submitted with the bid in accordance with this part.

**Motor Vehicle Pollution.** 40 CFR Parts 84 and 85, Motor Vehicle Pollution Requirements, establish emission standards for vehicles, and are applicable to Federal contracts for vehicle acquisition.

**Safe Vehicles.** Contracts for vehicles must comply with 49 CFR Part 500, Motor Vehicle Safety Standards, which set forth requirements for delivery of safe vehicles.

**Accessible Vehicles.** Contractors must comply with 49 CFR Part 27, Elderly and Handicapped. This regulation implements Section 504 of the Rehabilitation Act of 1973, and outlines accessibility requirements. In the provision of accessible vehicles, the contractor shall also comply with the U.S. Department of Transportation regulations Americans with Disabilities (ADA) Accessibility Specifications for Transportation Vehicles, 49 CFR Part 38.



**BUY AMERICA CERTIFICATE (A)**

**Certification requirement for procurement of steel, iron, or manufactured projects:**

*Certificate of Compliance with 49 CFR U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 CFR Part 661.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

*Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(1), but may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(B) or (j)(2)(D) and the regulations in 49 CFR 661.7.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

**BUY AMERICA CERTIFICATE (B)**

**Certification requirement for procurement of buses, other rolling stock and assorted equipment.**

*Certificate of Compliance with 49 U.S.C. 5323(j)(2)(C)*

The bidder or offeror hereby certifies that it will comply with the requirements of 49 CFR U.S.C. 5323(j)(2)(C) and the regulations at 49 CFR Part 661.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

*Certificate of Non-Compliance with 49 U.S.C. 5323(j)(2)(C)*

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 CFR U.S.C. 5323(j)(2)(C), but may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(B) or (j)(2)(D) and the regulations at 49 CFR Part 661.7.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

**CERTIFICATION OF COMPLIANCE WITH  
FTA'S BUS TESTING REQUIREMENTS**

The undersigned certifies that the vehicle offered in this procurement complies with 49 U.S.C. subsection 5323(c) and FTA's implementing regulation at 49 CFR Part 665.

The undersigned understand that misrepresenting the testing status of a vehicle acquired with Federal financial assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation's regulation on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

**Certification requirement for procurement of buses, other rolling stock and assorted equipment.**

*Certificate of Compliance with 49 U.S.C. 5323(j)(2)(C)*

The bidder or offeror hereby certifies that it will comply with the requirements of 49 CFR U.S.C. 5323(j)(2)(C) and the regulations at 49 CFR Part 661.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

**49 CFR PART 20--CERTIFICATION REGARDING LOBBYING**

Certification for Contracts, Grants, Loans, and Cooperative Agreements

*(To be submitted with each bid or offer exceeding \$100,000)*

The undersigned certifies to the best of his/her knowledge and belief, that: (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, or an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement. (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, Disclosure Form to Report Lobbying, in accordance with its instructions [as amended by Government wide Guidance for New Restrictions on Lobbying, 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified as 2 U.S.C. 1601 *et seq.*)] (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C., subsection 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure. [Note: Pursuant to 31 U.S.C. subsection 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such expenditure or failure.]

The contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the contractor understands and agrees that the provisions of 31 U.S.C., subsection 3801, *et seq.*, apply to this certification and disclosure, if any.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

**DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS**

As required by U.S. Department of Transportation regulations on Government and Suspension at 49 CFR 29.510, the Contractor certifies to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) transaction or contract under a public transaction; violation of Federal or state anti-trust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
- (3) Are not presently indicted or otherwise criminally or civilly charged by a government entity (Federal, state, or local) with the commission of any of the offenses listed in paragraph (2) of this certification.
- (4) Have not within a three-year period preceding this contract had one or more public transactions (Federal, state, or local) terminated for cause of default.

The contractor certifies that if it becomes aware of any later information that contradicts the statements of paragraphs (1) through (4) above, it will promptly inform FTA. Should the contractor be unable to certify to the statements of paragraphs (1) through (4) above, it shall acknowledge on its signature page and provide a written explanation to FTA.

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Signature of Authorized Individual

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Title

This certification must be attached and returned with any bid/proposal/offer exceeding \$100,000.

## APPEALS AND REMEDIES - FTA GRANT REQUIREMENTS

## (A) PROTESTS

(1) *Right to Protest*

Any actual or prospective bidder, offeror, or contractor who is aggrieved in connection with the solicitation or award of a contract may file a written protest with the Purchasing Director. A protest with respect to an Invitation for Bids or Request for Proposal shall be submitted in writing prior to the opening of bids or the closing date of proposals, unless the aggrieved person did not know and would not have known of the facts giving rise to such protest prior to bid opening or the closing date for proposals. In all cases, the protest shall be submitted within ten (10) calendar days after receiving knowledge of the action about which the protest is being made.

(2) *Stay of Procurement During Protests*

In the event of a timely protest, the Purchasing Director shall not proceed further with the solicitation or award of the contract until all administrative remedies have been exhausted or until the City Manager makes a determination on the record that the award of a contract without delay is necessary to protect substantial interests of the City.

(3) *Notification of Granter Agency - Grant Funding*

If a procurement action which spends grant funding is subject to a protest, the grantor agency shall be notified in writing of such protest and any subsequent response made by the City or the challenging vendor.

(4) *Decision of Purchasing Director*

The Purchasing Director shall issue a decision in writing within fourteen (14) calendar days after receipt of such protest or notice of other controversy. A copy of that decision shall be mailed, or otherwise furnished, to the aggrieved party and shall state the reasons for the action taken.

(5) *Appeal*

The decision of the Purchasing Director shall be final and conclusive unless the aggrieved party files a written appeal with the Purchasing Director, addressed to the City Manager, within ten (10) calendar days after receipt of the Purchasing Director's decision.

(6) *Decision of City Manager*

The City Manager shall issue a decision, in writing, within fourteen (14) calendar days after receipt of appeal unless the parties agree to a longer period. The decision of the City Manager shall be final and conclusive, and a copy of that decision shall be mailed, or otherwise furnished, to the aggrieved party and shall state the reasons for the action taken. In the absence of a decision by the City Manager within the time specified, the decision of the Purchasing Director shall stand.

**(B) CONTRACT CLAIMS****(1) *Decision of the Purchasing Director***

All claims by the contract against the City relating to a contractor, except bid protests, shall be submitted in writing to the Purchasing Director for a decision. The contractor may request a conference with the Purchasing Director on the claim. Claims include, without limitation, disputes arising under a contract and those based upon breach of contract, mistake, misrepresentation, or other cause for contract modification or rescission.

**(2) *Notice to the Contractor of the Purchasing Director's Decision***

The decision of the Purchasing Director shall be issued in writing within fourteen (14) calendar days after receipt of such protest, and shall be immediately mailed or otherwise furnished to the contractor. The decision shall state the reasons for the decision reached, and shall inform the contractor of its appeal rights.

**(3) *Finality of Purchasing Director's Decision: Contractor's Right to Appeal***

The Purchasing Director's decision shall be final and conclusive unless, within ten (10) calendar days from the date of receipt of the decision, the contractor mails or otherwise delivers a written appeal to the City Manager or commences an action in a court of competent jurisdiction.

**(4) *Decision of City Manager***

The City Manager shall issue a decision, in writing, within fourteen (14) calendar days after receipt of an appeal unless the parties agree to a longer period. The decision of the City Manager shall be final and conclusive and a copy of that decision shall be mailed, or otherwise furnished, to the aggrieved party, and shall state the reasons for the action taken. In the absence of a decision by the City Manager within the time specified, the decision of the Purchasing Director shall stand.



## **PREVAILING WAGE RATES**

Bid Ref #: 91038-011.0



"General Decision Number: MI20220087 08/05/2022

Superseded General Decision Number: MI20210087

State: Michigan

Construction Type: Building

County: Kalamazoo County in Michigan.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number	Publication Date
0	01/07/2022
1	02/18/2022

2	02/25/2022
3	04/01/2022
4	06/24/2022
5	07/08/2022
6	07/15/2022
7	07/29/2022
8	08/05/2022

\* ASBE0047-002 07/01/2022

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 34.62	18.58

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BOIL0169-001 01/01/2021

	Rates	Fringes
BOILERMAKER.....	\$ 35.95	34.52

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BRMI0009-031 08/01/2020

	Rates	Fringes
BRICKLAYER.....	\$ 31.01	20.36
TILE FINISHER.....	\$ 23.17	13.79
TILE SETTER.....	\$ 24.23	15.56

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CARP0525-013 06/01/2021

	Rates	Fringes
CARPENTER (Including Acoustical Ceiling Installation, Drywall Hanging, Form Work, Metal Stud Installation & Scaffold Builder).....	\$ 25.94	20.59

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CARP1102-001 06/01/2019

	Rates	Fringes
MILLWRIGHT.....	\$ 28.59	24.79

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ELEC0131-001 06/01/2022

	Rates	Fringes
ELECTRICIAN Excludes Low Voltage Wiring.	\$ 37.66	8.95+27%

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ENGI0324-002 06/01/2022

	Rates	Fringes
OPERATOR: Power Equipment		
GROUP 1.....	\$ 44.13	24.85
GROUP 2.....	\$ 40.83	24.85
GROUP 3.....	\$ 38.18	24.85
GROUP 4.....	\$ 36.47	24.85
GROUP 5.....	\$ 36.47	24.85
GROUP 6.....	\$ 30.61	24.85
GROUP 7.....	\$ 28.13	24.85

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: \$1.50 per hour above the group 1 rate.  
 Crane operator with main boom and jib 400' or longer: \$3.00 per hour above the group 1 rate.

PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane operator with main boom and jib 400', 300', or 220' or longer.

GROUP 2: Crane operator with main boom and jib 140' or longer, tower crane, gantry crane, whirley derrick

GROUP 3: Backhoe/Excavator/Trackhoe; Crane; Concrete Pump; Grader/Blade; Highlift; Hoist; Loader; Roller; Scraper; Stiff Leg Derrick; Trencher

GROUP 4: Bobcat/Skid Loader; Broom/Sweeper; Fork Truck (over 20' lift)

GROUP 5: Boom Truck (non-swinging)

GROUP 6: Fork Truck (20' lift and under for masonry work)

GROUP 7: Oiler

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 IRON0340-002 06/19/2017

	Rates	Fringes
IRONWORKER, REINFORCING AND STRUCTURAL.....	\$ 24.43	24.67

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 LABO0355-022 06/01/2022

	Rates	Fringes
LABORER Common or General; Grade Checker; Mason Tender - Brick; Mason Tender - Cement/Concrete; Sandblaster.....	\$ 26.70	12.95
Pipelayer.....	\$ 20.34	12.85

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 PAIN0312-002 06/01/2020

	Rates	Fringes
PAINTER: Brush and Roller.....	\$ 23.74	13.35
PAINTER: Drywall Finishing/Taping.....	\$ 23.74	13.35
PAINTER: Spray.....	\$ 25.22	13.47

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 PLAS0016-003 04/01/2014

	Rates	Fringes
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CEMENT MASON/CONCRETE FINISHER...\$ 22.31 12.83

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PLUM0357-001 07/01/2020

Excluding Fort Custer

	Rates	Fringes
PIPEFITTER, Includes HVAC Pipe and Unit Installation.....	\$ 35.20	22.35
PLUMBER, Excludes HVAC Pipe and Unit Installation.....	\$ 35.20	22.35

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ROOF0070-002 06/01/2022

	Rates	Fringes
ROOFER.....	\$ 30.03	16.84

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SFMI0669-001 04/01/2022

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 38.69	24.66

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SHEE0007-010 05/01/2018

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 32.61	19.66

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\* SUMI2011-012 02/01/2011

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 18.48	7.93
LABORER: Landscape & Irrigation.....	\$ 10.38 **	0.50
OPERATOR: Bulldozer.....	\$ 19.68	6.64
OPERATOR: Tractor.....	\$ 19.10	8.48
SHEET METAL WORKER, Excludes HVAC Duct and Unit Installation.....	\$ 23.59	5.66
TRUCK DRIVER: Dump Truck.....	\$ 17.26	11.42
TRUCK DRIVER: Lowboy Truck.....	\$ 14.50 **	0.44
TRUCK DRIVER: Tractor Haul Truck.....	\$ 13.57 **	1.18

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WELDERS - Receive rate prescribed for craft performing  
operation to which welding is incidental.

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\*\* Workers in this classification may be entitled to a higher  
minimum wage under Executive Order 14026 (\$15.00) or 13658

(\$11.25). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average

rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an

interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"



# **TECHNICAL SPECIFICATIONS**

Bid Ref #: 91038-011.0



## TABLE OF CONTENTS

### **DIVISION 01 – GENERAL REQUIREMENTS**

01 33 00 Submittal Procedures

### **DIVISION 06 – WOOD, PLASTIC, AND COMPOSITIES**

06 10 00 Rough Carpentry

06 10 53 Miscellaneous Rough Carpentry

### **DIVISION 07 – THERMAL MOISTURE PROTECTION**

07 21 29 Spray Foam Insulation

07 84 43 Joint Firestopping

### **DIVISION 10 – SPECIALTIES**

10 44 16 Fire Extinguishers

### **DIVISION 23 – HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**

23 05 17 Sleeves and Sleeve Seals for HVAC Piping

23 05 29 Hangers and Supports for HVAC Piping and Equipment

23 05 53 Identification for HVAC Piping and Equipment

23 07 19 HVAC Piping Insulation

23 23 00 Refrigerant Piping

23 81 26.13 Small-Capacity Split-System Air Conditioners

### **DIVISION 26 – ELECTRICAL**

26 05 19 Low-Voltage Electrical Power Conductors and Cables

26 05 26 Grounding and Bonding for Electrical Systems

26 05 29 Hangers and Supports for Electrical Systems

26 05 33.13 Conduit for Electrical Systems

26 05 83 Wiring Connections

26 28 16.16 Enclosed Switches

## SECTION 013300 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Submittal schedule requirements.
  - 2. Administrative and procedural requirements for submittals.

#### 1.3 DEFINITIONS

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

#### 1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

- a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
  - a. Scheduled date for first submittal.
  - b. Specification Section number and title.
  - c. Submittal Category: Action; informational.
  - d. Name of subcontractor.
  - e. Description of the Work covered.
  - f. Scheduled date for Architect's final release or approval.
  - g. Scheduled dates for purchasing.
  - h. Scheduled date of fabrication.
  - i. Scheduled dates for installation.
  - j. Activity or event number.

## 1.5 SUBMITTAL FORMATS

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

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
  4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
  5. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
  6. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using an approved transmittal form.
- E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

## 1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Email: Prepare submittals as PDF package, and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
    - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
  2. Paper: Prepare submittals in paper form, and deliver to Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

## 1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams that show factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
    - a. Two opaque (bond) copies of each submittal. Architect will return one copy.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
    - a. Project name and submittal number.
    - b. Generic description of Sample.
    - c. Product name and name of manufacturer.
    - d. Sample source.
    - e. Number and title of applicable Specification Section.
    - f. Specification paragraph number and generic name of each item.
  3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
  4. Paper Transmittal: Include paper transmittal including complete submittal information indicated.

5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
      - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and

addresses, contact information of architects and owners, and other information specified.

- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
  2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
  3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
  4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
  5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
  6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
  2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
  3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
  4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
  5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract



Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - a. Name of evaluation organization.
  - b. Date of evaluation.
  - c. Time period when report is in effect.
  - d. Product and manufacturers' names.
  - e. Description of product.
  - f. Test procedures and results.
  - g. Limitations of use.

#### 1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

#### 1.9 CONTRACTOR'S REVIEW

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

1.10 ARCHITECT'S REVIEW

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Wood blocking and nailers.
  - 2. Plywood backing panels.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.
3. Post-installed anchors.
4. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  3. Dress lumber, S2S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

### 2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
- B. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Mixed southern pine or southern pine; No. 3 grade; SPIB.
  - 2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA.
  - 3. Spruce-pine-fir (south) or spruce-pine-fir; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
  - 4. Eastern softwoods; No. 3 Common grade; NeLMA.
  - 5. Northern species; No. 3 Common grade; NLGA.
  - 6. Western woods; Standard or No. 3 Common grade; WCLIB or WWPA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

### 2.4 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

## 2.5 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
  - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
  2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  3. ICC-ES evaluation report for fastener.
- H. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

## SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

### 1.1 MATERIALS

#### A. Wood Products, General:

1. Maximum Moisture Content of Lumber: 15 percent.
2. Refer to drawings for member sizing.

#### B. Wood-Preservative-Treated Materials:

1. Preservative Treatment: AWWPA U1; Use Category UC2.
  - a. Preservative Chemicals: Containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
2. Application: All miscellaneous carpentry.

#### C. Engineered Wood Products: Wood I-joists.

1. Flange members, web members and adhesives shall conform to the provisions of the ICC ES ESR-1153.
2. Joists shall be manufactured in a plant listed in the reports referred to above and under the supervision of an approved third-party inspection agency.
3. Each of the joists shall be identified by a stamp indicating the joist series and ICC ES evaluation report number, manufacturer's name, plant number and the independent inspection agency's logo.
4. If stored prior to installation, I-joists shall be stored in a vertical position and protected from the weather. They shall be handled with care so they are not damaged. Joists are to be installed in accordance with the plans and any manufacturer's drawings and installation suggestions. Temporary construction loads that cause stresses beyond design limits are not permitted. Safety bracing is to be provided by the installer to keep the I-joists straight and plumb as required and to assure adequate lateral support for the individual joists and the entire system until the sheathing material has been applied.
5. The contractor may give notification to the manufacturer prior to installation of I-joist products to review and discuss product installation guidelines.
6. Products shall be proven by testing and evaluation in accordance with the provisions of ASTM D-5055.
7. The products delivered shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed and maintained, shall be warranted to perform as designed for the normal and expected life of the building.

#### D. Metal Framing Anchors:

1. Metal: Galvanized steel; hot-dip heavy galvanized steel for wood-preservative-treated lumber and where indicated.



1.2 INSTALLATION

- A. Furring to Receive Plywood or Hardboard Paneling: 1-by-3-inch nominal-size furring at 24 inches o.c.
- B. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- C. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 2. ICC-ES evaluation report for fastener.

END OF SECTION 06 10 53

## SECTION 072129 – SPRAY FOAM INSULATION

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Spray-in-place, medium-density, semi-rigid, closed-cell polyurethane foam insulation in assemblies indicated on the Drawings, to provide an air barrier and insulation.  
(ThermoSeal  
2000, ThermoSeal 2100, ThermoSeal CCX)

#### RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

#### 1.2 REFERENCES

- A. ASTM International (ASTM):
  1. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
  2. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
  3. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
  4. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
  5. ASTM D 1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
  6. ASTM D 2126 - Standard Test Method for Response of Rigid Cellular Plastic to Thermal and Humid Aging.
  7. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Plastics.
  8. ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics.
  9. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
  11. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  12. ASTM E 413 - Classification for Rating Sound Insulation.
- B. Greenguard Certification from UL Environment.

- C. International Code Council - International Residential Code.
- D. International Code Council - International Building Code.
- E. ICC Evaluation Service.
- F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- G. Standards Council of Canada: CAN/ULC-S776-09: Standard Laboratory Guide for the Determination of Volatile Organic Compound Emissions from Polyurethane Foam.

### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Before commencing work, submit in accordance with local code:
  - 1. Technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).
  - 2. Other technical data sheets and samples as required by local code officials.
- C. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.

### QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Contractor performing work under this section shall be trained and certified by ThermoSeal, LLC in the art of application of spray polyurethane foam insulation.
- B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and Application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until installation is approved by Architect.
  - 3. Rework mock-up area as required to produce acceptable work.

### DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be delivered in manufacturer's original containers clearly labeled with manufacturer's name, product identification, safety information, net weight of contents and expiration date.

- B. Material shall be stored in a safe manner and where the temperatures are in the limits specified by the material manufacturer.
- C. Empty containers shall be removed from site on a daily basis

## PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. Ventilate insulation application area in accordance with the Spray Foam Coalition's Guidance on best practices for the installation of Spray Polyurethane Foam.
- C. Protect workers as recommended by the standards of the Spray Foam Coalition's Guidance on best practices for the installation of Spray Polyurethane Foam.
- D. Protect adjacent surfaces, windows, equipment and site areas from damage of overspray.

### 1.4 WARRANTY

- A. Manufacturer's Warranty: ThermoSeal, LLC warrants spray-in-place urethane foam insulation, when installed by authorized contractors using factory-trained applicators and applied in accordance to the Installation Instructions, will perform as stated in the Product Technical Data Sheet.
  - 1. This warranty is in effect throughout the life of the building provided the original purchaser registers with the Warranty Department of the Manufacturer within thirty days of occupancy.
  - 2. Manufacturer's sole responsibility under this Limited Lifetime Warranty shall be to repair or replace any defective Product at the cost of the material only.
  - 3. Manufacturer shall not be responsible for labor cost or any other costs whatsoever related to, or in connection with the removal or installation of either the original or replacement product.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: ThermoSeal, LLC , which is located at: P. O. Box 32; New Canaan, CT 06840 ; Toll Free Tel: 800-853-1577; Email:request info (info@thermosealusa.com); Web:www.thermosealusa.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 0160
  - 1. Substitutions: Approved Equal

## 2.2 SPRAY FOAM INSULATION

- A. Spray Applied Semi Rigid Polyurethane Closed Cell Foam Insulation System: Two component, medium density.
  1. Product: ThermoSeal CCX manufactured by ThermoSeal, LLC.
  2. Product Approval:
    - a. Approved for use in wall cavities, floor assemblies, ceiling assemblies or attics and crawl spaces in Type VB construction (IBC) and dwellings under the IRC.
    - b. Approved for use in building types I, II, III, IV, and V construction under IBC and dwellings for IRC.
    - c. Passed AC 377 Appendix X compliant NFPA 286.
    - d. Evaluation Report: ICC-ESR Pending Publication
  3. Contains zero ozone depleting agents, catalysts, polyols, and fire retarding materials.
  4. Fills cracks, crevices, and voids to form air seal and thermal insulation.
  5. Physical Properties:
    - a. Density (ASTM D 1622): 2.23 lb/cf Summer, 2.17 lb/cf Winter.
    - b. Thermal Resistance (ASTM C 518): R-6.7 (sf.h degree F/BTU) at 1 inch Summer, R-6.9 (sf.h degree F/BTU) at 1 inch Winter.
    - c. Closed Cell Content (ASTM D 6226): Greater than 93 percent.
    - d. Water Vapor Transmission - Permeance (ASTM E 96): Less than 1 Perms at 1.625 inches.
    - e. Air Leakage (ASTM E 283): Less than 0.002 L/sm<sup>2</sup>
    - f. Compressive Strength (ASTM D 1621): 18 psi Summer, 23 psi Winter.
    - g. Tensile Strength (ASTM D 1623): 18 psi Summer, 54 psi Winter.
    - h. Dimensional Stability (ASTM D 2126): 5.45 percent Summer, 4.14 percent Winter.
    - i. Water Absorption by volume (ASTM D 2842): 0.87 percent Summer, 0.81 percent Winter.
    - j. VOC Emissions (UL Greenguard Gold): Meets Criteria.
    - k. Fungi Resistance (ASTM C 1338): Zero Rating.
    - l. Surface Burning Characteristics (ASTM E 84): Class 1 Pass, Flame Spread Index 5, Smoke Developed Index 350 Summer, 450 Winter.
  6. Equipment used to apply the foam insulation shall have fixed ratio positive displacement pumps and approved by ThermoSeal, LLC.
  7. Equipment used to apply the water based intumescent coating shall be an airless sprayer approved by ThermoSeal, LLC.

8. Thermal Barrier: DC315 manufactured by International Fireproof Technology, Inc.
  - a. Ignition Barrier AC 377 Appendix X compliant NFPA 286 (No Ignition Barrier required in attics and spaces.:
  - b. Thermal Barrier (NFPA 286): Pass at 88.88 sq.ft./gal at 18 mils wet, 12 mils dry, coverage rate of 1.136 gallons (4.3 L) per 100 square feet (9.2 m<sup>2</sup>)

## 2.3 ACCESSORY PRODUCTS

### A. Water Based Intumescent Coating:

1. Product: DC315 Intumescent Coating, Manufactured by International Fireproof Technologies, Inc. (IFTI).
2. Application: Follow manufacturer's application recommendations.
3. Physical Properties:
  - a. Surface Burning Characteristics (ASTM E 84): Class I. Flame Spread Index of 0, Smoke Developed Index less than 25
  - b. Expands up to 2000 percent.
  - c. Flash Point: None.
  - d. Volatility/VOC: Less than 50 g/L.
  - e. Non-toxic, drain safe, water based, non-fuming.
4. Color: Dull flat / light gray or special order white and dark gray.
  - a. Do not add tint.
  - b. Wait minimum 24 hours prior to topcoating with quality latex paint. Verify dryness with moisture meter.
5. Refer to products International Code Council Evaluation Services Report for additional Intumescent Coating information.

### B. Water Based Intumescent Coating:

1. Product: Pyrodyne (Acry-Tek 5026) Fire-Retardant Acrylic Coating manufactured by  
by  
Acella, Inc.
2. Application: Follow manufacturer's application recommendations.
3. Physical Properties:
  - a. Surface Burning Characteristics (ASTM E 84): Class I. Flame Spread Index of 10, Smoke Developed Index less than 25
  - b. Flash Point: None.
  - c. Volatility/VOC: Less than 50 g/L.
4. Color: White.

5. Refer to products International Code Council Evaluation Services Report for additional  
Intumescent Coating information

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.
- D. Remove unused hangers and fasteners prior to installation. Protect existing wiring, conduits, and ductwork to remain.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved submittals. Apply as recommended by manufacturer to thickness as indicated on drawings.
- B. Apply thermal barrier as required by applicable codes noting the following:
  1. Except as provided in Section 314.5 and Section 314.6 of the 2006 International Residential Code, Section 316.5 and Section 316.6 of the 2009 International Residential Code and Section 2603.4.1 and Section 2603.9 of the International Building Code, all plastic insulation shall be separated from the interior of the building by an approved thermal barrier of 1/2 inch (13 mm) gypsum wallboard or equivalent thermal barrier material. Code compliant intumescent coating in lieu of a thermal barrier may be achieved with the use of DC 315. For more information contact ThermoSeal, LLC for assistance, (800) 853-1577.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion

END OF SECTION

## SECTION 078443 - JOINT FIRESTOPPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Joints in or between fire-resistance-rated constructions.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
  - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.



## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

## 1.8 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
  - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
    - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
      - 1) UL in its "Fire Resistance Directory."
      - 2) Intertek Group in its "Directory of Listed Building Products."

### 2.2 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E 1966 or UL 2079.
  - 1. Manufacturers: Provide joint firestopping systems from one of the following
    - a. Tremco
    - b. Hilti, Inc.
    - c. Pecora Corp.
    - d. Isolatek Intl.
    - e. 3M
    - f. National Fireproofing Inc.
  - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- D. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Surface Cleaning: Before installing fire-resistive joint systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
  - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.

- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

### 3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for fire-resistive joint systems by proven techniques to produce the following results:
  - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
  - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
  - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 FIELD QUALITY CONTROL

- A. Inspecting Agency: Engage a qualified testing agency to perform tests and inspections according to ASTM E 2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

### 3.5 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and

remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

### 3.6 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.
- B. Where Intertek Group-listed systems are indicated, they refer to design numbers in Intertek Group's "Directory of Listed Building Products" under product category Firestop Systems.
- C. Wall-to-Wall, Joint Firestopping Systems:
  - 1. UL-Classified Systems: WW-D-0000-0999.
  - 2. Assembly Rating: 2 hours.
  - 3. Nominal Joint Width: As indicated.
  - 4. Movement Capabilities: Class II 25 percent compression or extension.
  - 5. L-Rating at Ambient: Less than 1 cfm/ft.
  - 6. L-Rating at 400 Deg F: Less than 1 cfm/ft.
- D. Floor-to-Wall, Joint Firestopping Systems:
  - 1. UL-Classified Systems: FW-D-0000-0999.
  - 2. Assembly Rating: 2 hours.
  - 3. Nominal Joint Width: 1 inch.
  - 4. Movement Capabilities: Class II or Class III - 25 percent compression, extension, or horizontal shear.
  - 5. L-Rating at Ambient: Less than 1 cfm/ft.
  - 6. L-Rating at 400 Deg F: Less than 1 cfm/ft.
- E. Head-of-Wall, Fire-Resistive Joint Firestopping Systems:
  - 1. UL-Classified Systems: HW-D-0000-0999.
  - 2. Assembly Rating: 2 hours.
  - 3. Nominal Joint Width: 2 inches.
  - 4. Movement Capabilities: Class II or Class III - 50 percent compression or extension.
  - 5. L-Rating at Ambient: Less than 1 cfm/ft.
  - 6. L-Rating at 400 Deg F: Less than 1 cfm/ft.

END OF SECTION 078443

## SECTION 104416 - FIRE EXTINGUISHERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure of hydrostatic test according to NFPA 10.
    - b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
  1. Provide fire extinguishers approved, listed, and labeled by FM Global.

### 2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
  1. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
  2. Valves: Manufacturer's standard.
  3. Handles and Levers: Stainless steel.
  4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container FE-1: 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.
- C. Clean-Agent Type (Halotron I) in Aluminum Container FE-2: UL-rated 5-B:C, 4.75-lb nominal capacity, with HFC Blend B agent and inert material in enameled-steel container; with pressure-indicating gage.

### 2.3 MOUNTING BRACKETS - MB-1

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.
  1. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
  1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
  - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
  - 1. Mounting Brackets: Top of fire extinguisher to be at 42 inches above finished floor.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

## **SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Pipe sleeves.
- B. Pipe-sleeve seals.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 078443 – Joint Firestopping.
- B. Section 230553 - Identification for HVAC Piping and Equipment: Piping identification.
- C. Section 230719 - HVAC Piping Insulation.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified this section.
  - 1. Minimum three years experience.
  - 2. Approved by manufacturer.
- C. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

### **PART 2 PRODUCTS**

#### **2.01 PIPE SLEEVES**

- A. Manufacturers:
  - 1. Flexicraft Industries; Pipe Wall Sleeve: [www.flexicraft.com/#sle](http://www.flexicraft.com/#sle).
  - 2. Substitutions: Approved equals.
- B. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- C. Clearances:
  - 1. Provide allowance for insulated piping.



2. Wall, Floor, Partitions, and Beam Flanges: 1 inch greater than external pipe diameter.
3. All Rated Openings: Caulked tight with fire stopping material in compliance with ASTM E814 in accordance with Section 078443 to prevent the spread of fire, smoke, and gases.

## **2.02 PIPE-SLEEVE SEALS**

- A. Manufacturers:
  1. Advance Products & Systems, LLC; Innerlynx: [www.apsonline.com/#sle](http://www.apsonline.com/#sle).
  2. American Polywater Corporation; PGKD Modular Seals: [www.polywater-haufftechnik.com/#sle](http://www.polywater-haufftechnik.com/#sle).
  3. Flexicraft Industries; PipeSeal: [www.flexicraft.com/#sle](http://www.flexicraft.com/#sle).
  4. Substitutions: Approved equals.
- B. Sealing Compounds:
  1. Provide packing and sealing compound to fill pipe to sleeve thickness.
  2. Combined packing and seal compound is to match partition fire-resistance hourly rating.
- C. Pipe Sleeve Material:
  1. Bearing Walls: Steel, cast iron, or terra-cotta pipe.
  2. Masonry Structures: Sheet metal or fiber.
- D. Wall Sleeve: PVC material with waterstop collar, and nailer end-caps.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

### **3.02 INSTALLATION**

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- B. Install piping to conserve building space, to not interfere with use of space and other work.
- C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- D. Provide sleeves when penetrating floors and walls. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- E. Manufactured Sleeve-Seal Systems:
  1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
  2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
  3. Locate piping in center of sleeve or penetration.
  4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
  5. Tighten bolting for a water-tight seal.
  6. Install in accordance with manufacturer's recommendations.
- F. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

**3.03 CLEANING**

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**END OF SECTION**

## **SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Support and attachment components.

#### **1.02 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping 2022.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures 1999 (Reapproved 2018).
- H. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.
- J. FM (AG) - FM Approval Guide current edition.
- K. MFMA-4 - Metal Framing Standards Publication 2004.
- L. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
- M. UL (DIR) - Online Certifications Directory Current Edition.
- N. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

#### **1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
  - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 033000.

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.
- C. Installer's Qualifications: Include evidence of compliance with specified requirements.

#### **1.05 QUALITY ASSURANCE**

- A. Comply with applicable building code.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

### **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 plumbing 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 1.5. Include consideration for vibration, equipment operation, and shock loads where applicable.
  4. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
  5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
    - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
    - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Prefabricated Trapeze-Framed Metal Strut Systems:
  1. Manufacturers:
    - a. Cooper B-Line, a division of Eaton Corporation  
: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Unistrut, a brand of Atkore International Inc: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
    - c. Substitutions: Approved equals.

- d. Source Limitations: Furnish hardware, fittings, and accessories from single manufacturer.
  2. Strut Channel or Bracket Material:
    - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
  3. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
  4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
  5. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.
- C. Channel Nuts:
1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring.
- D. Hanger Rods:
1. Threaded zinc-plated steel unless otherwise indicated.
  2. Minimum Size, Unless Otherwise Indicated or Required:
    - a. Piping up to 1 inch: 1/4 inch diameter.
    - b. Trapeze Support for Multiple Pipes: 3/8 inch diameter.
- E. Beam Clamps:
1. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
  2. Beam C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
  3. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
  4. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
  5. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
  6. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish,
  7. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
  8. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
- F. Insulation Clamps:
1. Two bolt-type clamps designed for installation under insulation.
  2. Material: Carbon steel with epoxy copper or zinc finish.
- G. Pipe Hangers:
1. Split Ring Hangers:
    - a. Provide hinged split ring and yoke roller hanger with epoxy copper or plain finish.
    - b. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.
    - c. Provide hanger rod and nuts of the same type and material for a given pipe run.
    - d. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
  2. Swivel Ring Hangers, Adjustable:

- a. MSS SP-58 Type 10, epoxy-painted, zinc-colored.
  - b. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
  - c. FM (AG) and UL (DIR) listed for specific pipe size runs and loads.
3. Clevis Hangers, Adjustable:
- a. Copper Tube: MSS SP-58 Type 1, epoxy-plated copper.
- H. Pipe Shields for Insulated Piping:
1. Manufacturers:
    - a. Anvil International: [www.anvilintl.com/#sle](http://www.anvilintl.com/#sle).
    - b. FNW; 7750: [www.fnw.com/#sle](http://www.fnw.com/#sle).
    - c. Substitutions: Approved equals.
    - d. Source Limitations: Furnish hardware, fittings, and accessories from single manufacturer.
  2. General Construction and Requirements:
    - a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
    - b. Shields Material: UV-resistant polypropylene with glass fill.
    - c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
    - d. Minimum Service Temperature: Minus 40 degrees F.
    - e. Maximum Service Temperature: 178 degrees F.
    - f. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
- I. Anchors and Fasteners:
1. Manufacturers - Mechanical Anchors:
    - a. FNW; 7502: [www.fnw.com/#sle](http://www.fnw.com/#sle).
    - b. Hilti, Inc: [www.us.hilti.com/#sle](http://www.us.hilti.com/#sle).
    - c. ITW Red Head, a division of Illinois Tool Works, Inc : [www.itwredhead.com/#sle](http://www.itwredhead.com/#sle).
    - d. Powers Fasteners, Inc: [www.powers.com/#sle](http://www.powers.com/#sle).
    - e. Simpson Strong-Tie Company Inc: [www.strongtie.com/#sle](http://www.strongtie.com/#sle).
    - f. Substitutions: Approved equals.
  2. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
  3. Hollow Stud Walls: Use toggle bolts.
  4. Steel: Use beam-ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
  5. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
  6. Sheet Metal: Use sheet metal screws.
  7. Wood: Use wood screws.
  8. Plastic and lead anchors are not permitted.
  9. Powder-actuated fasteners are not permitted.
  10. Hammer-driven anchors and fasteners are not permitted.
- J. Pipe Installation Accessories:

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.

- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- C. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- F. 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.
- G. Secure fasteners according to manufacturer's recommended torque settings.
- H. Remove temporary supports.

### **3.03 FIELD QUALITY CONTROL**

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.

**END OF SECTION**

## **SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Nameplates.

#### **1.02 REFERENCE STANDARDS**

- A. ASTM D709 - Standard Specification for Laminated Thermosetting Materials 2017.

#### **1.03 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.

### **PART 2 PRODUCTS**

#### **2.01 IDENTIFICATION APPLICATIONS**

- A. Small-sized Equipment: Nameplates.
- B. Thermostats: Nameplates.

#### **2.02 NAMEPLATES**

- A. Manufacturers:
  - 1. Advanced Graphic Engraving, LLC: [www.advancedgraphicengraving.com/#sle](http://www.advancedgraphicengraving.com/#sle).
  - 2. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 4. Seton Identification Products, a Tricor Direct Company: [www.seton.com/#sle](http://www.seton.com/#sle).
  - 5. Substitutions: Approved equals.
- B. Letter Color: White.
- C. Letter Height: 1/4 inch.
- D. Background Color: Black.
- E. Plastic: Comply with ASTM D709.

#### **2.03 TAGS**

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

#### **3.02 INSTALLATION**

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

**END OF SECTION**



## **SECTION 230719 - HVAC PIPING INSULATION**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Piping insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Engineered wall outlet seals and refrigerant piping insulation protection.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 078443 – Joint Firestopping.
- B. Section 232300 - Refrigerant Piping: Placement of inserts.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.
- D. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).
- E. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).
- F. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials 2021a.
- G. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials 2013 (Reapproved 2021).
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

### **1.07 FIELD CONDITIONS**

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

## **PART 2 PRODUCTS**

### **2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

### **2.02 FLEXIBLE ELASTOMERIC CELLULAR INSULATION**

- A. Manufacturers:
  - 1. Aeroflex USA, Inc; Aerocel Stay-Seal with Protape (SSPT): [www.aeroflexusa.com/#sle](http://www.aeroflexusa.com/#sle).
  - 2. Armacell LLC; ArmaFlex Ultra with FlameDefense: [www.armacell.us/#sle](http://www.armacell.us/#sle).
  - 3. K-Flex USA LLC; K-Flex Titan: [www.kflexusa.com/#sle](http://www.kflexusa.com/#sle).
  - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
  - 1. Minimum Service Temperature: Minus 40 degrees F.
  - 2. Maximum Service Temperature: 180 degrees F.
  - 3. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

### **2.03 ENGINEERED WALL OUTLET SEALS AND REFRIGERANT PIPING INSULATION PROTECTION**

- A. Pipe Penetration Wall Seal: Seals HVAC piping wall penetrations with compression gasket wall mounted rigid plastic outlet cover.
  - 1. Wall Outlet Size, Siding and Compact Applications: 6-7/8 inch wide by 3-7/8 inch high.
    - a. Elastomeric Sleeve Diameter: 1-11/16 inch.
  - 2. Outlet Cover Color: Gray.
  - 3. Water Penetration: Comply with ASTM E331.
  - 4. Air Leakage: Comply with ASTM E283.
  - 5. Air Permeance: Comply with ASTM E2178.
- B. Insulation Protection System: Refrigerant piping insulation PVC protective cover.
  - 1. PVC Insulation Cover Color: Black with full-length velcro fastener.
  - 2. Weatherization and Ultraviolet Exposure Protection: Comply with ASTM G153.
  - 3. Flame Spread and Smoke Development Rating of 24/450: Comply with ASTM E84 or UL 723.
  - 4. Tensile Strength After UV Exposure and Water Immersion: Comply with ASTM D412.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Insulated Pipes Conveying Fluids Below Ambient Temperature:
  - 1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- C. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 078443.
- D. Exterior Applications: Provide two coats of UV resistant finish for flexible elastomeric cellular insulation without jacketing.

### **3.03 SCHEDULE**

- A. Cooling Systems:
  - 1. Refrigerant Suction:
    - a. Flexible Elastomeric Cellular Insulation.
  - 2. Refrigerant Hot Gas:
    - a. Flexible Elastomeric Cellular Insulation.

**END OF SECTION**

## **SECTION 232300 - REFRIGERANT PIPING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Piping.
- B. Refrigerant.
- C. Moisture and liquid indicators.
- D. Filter-driers.
- E. Expansion valves.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 230719 - HVAC Piping Insulation.

#### **1.03 REFERENCE STANDARDS**

- A. AHRI 710 - Performance Rating of Liquid-Line Driers 2009.
- B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems 2019, with All Amendments and Errata.
- C. ASHRAE Std 34 - Designation and Safety Classification of Refrigerants 2019.
- D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2021.
- E. ASME B31.5 - Refrigeration Piping and Heat Transfer Components 2020.
- F. ASME B31.9 - Building Services Piping 2020.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- H. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service 2020.
- I. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding 2019.
- J. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide general assembly of specialties, including manufacturers catalogue information. Provide manufacturers catalog data including load capacity.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store piping and specialties in shipping containers with labeling in place.
- B. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.
- C. Dehydrate and charge components such as piping and receivers, seal prior to shipment, until connected into system.

## **PART 2 PRODUCTS**

### **2.01 SYSTEM DESCRIPTION**

- A. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.
- B. Liquid Indicators:
  - 1. Use line size liquid indicators in main liquid line leaving condenser.
- C. Filter-Driers:
  - 1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.

### **2.02 REGULATORY REQUIREMENTS**

- A. Comply with ASME B31.9 for installation of piping system.
- B. Products Requiring Electrical Connection: Listed and classified by UL, as suitable for the purpose indicated.

### **2.03 PIPING**

- A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
  - 1. Fittings: ASME B16.22 wrought copper.
  - 2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.
- B. Pipe Supports and Anchors:
  - 1. Provide hangers and supports that comply with MSS SP-58.
    - a. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron adjustable swivel, split ring.
  - 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 4. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
  - 5. Vertical Support: Steel riser clamp.
  - 6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
  - 7. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
  - 8. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.
  - 9. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
    - a. Bases: High density, UV tolerant, polypropylene or reinforced PVC.
    - b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
    - c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
    - d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
    - e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.

- f. Manufacturers:
  - 1) PHP Systems/Design: [www.phpsd.com/#sle](http://www.phpsd.com/#sle).
  - 2) Portals Plus; Pedestal Plus: [www.portalsplus.com/#sle](http://www.portalsplus.com/#sle).
  - 3) Substitutions: Approved equals

#### **2.04 REFRIGERANT**

- A. Refrigerant: R-134a, tetrafluoroethane as defined in ASHRAE Std 34.

#### **2.05 MOISTURE AND LIQUID INDICATORS**

- A. Indicators: Single port type, UL listed, with copper or brass body, flared or solder ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 500 psi.

#### **2.06 VALVES**

#### **2.07 STRAINERS**

#### **2.08 FILTER-DRIERS**

- A. Performance:
  - 1. Flow Capacity - Liquid Line: rated in accordance with AHRI 710.
  - 2. Pressure Drop: 2 psi, maximum, when operating at full connected evaporator capacity.
  - 3. Design Working Pressure: 350 psi, minimum.
- B. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.
- C. Construction: UL listed.
  - 1. Connections: As specified for applicable pipe type.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

#### **3.02 INSTALLATION**

- A. Install refrigeration specialties in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- E. Pipe Hangers and Supports:
  - 1. Install in accordance with ASME B31.5.
  - 2. Support horizontal piping as indicated.
  - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 4. Place hangers within 12 inches of each horizontal elbow.
  - 5. Provide copper plated hangers and supports for copper piping.

- F. Arrange piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- G. Provide clearance for installation of insulation and access to valves and fittings.
- H. Flood piping system with nitrogen when brazing.
- I. Insulate piping and equipment.
- J. Follow ASHRAE Std 15 procedures for charging and purging of systems and for disposal of refrigerant.
- K. Fully charge completed system with refrigerant after testing.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Test refrigeration system in accordance with ASME B31.5.
- C. Pressure test system with dry nitrogen to 200 psi. Perform final tests at 27 inches vacuum and 200 psi using halide torch. Test to no leakage.

### **3.04 SCHEDULES**

- A. Hanger Spacing for Copper Tubing.
  - 1. 1/2 inch, 5/8 inch, and 7/8 inch OD: Maximum span, 5 feet; minimum rod size, 1/4 inch.
  - 2. 1-1/8 inch OD: Maximum span, 6 feet; minimum rod size, 1/4 inch.

**END OF SECTION**

## **SECTION 238126.13 - SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Air-source heat pumps.
- B. Air cooled condensing units.
- C. Indoor air handling (fan and coil) units for ductless systems.
- D. Controls.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections and installation and wiring of thermostats and other controls components.

#### **1.03 REFERENCE STANDARDS**

- A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment 2023.
- B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units 2004.
- C. NFPA 54 - National Fuel Gas Code 2021.
- D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- E. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems 2021.
- F. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances 2019.
- G. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical Current Edition, Including All Revisions.

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- C. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Carrier Corporation: [www.carrier.com/#sle](http://www.carrier.com/#sle).



- B. Trane Inc: [www.trane.com/#sle](http://www.trane.com/#sle).
- C. York International Corporation / Johnson Controls: [www.york.com/#sle](http://www.york.com/#sle).
- D. Substitutions: Approved equals.

## **2.02 SYSTEM DESIGN**

- A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
  - 1. Heating and Cooling: Air-source electric heat pump located in outdoor unit with evaporator; auxiliary electric heat.
  - 2. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
- B. Performance Requirements: See Drawings for additional requirements.

## **2.03 INDOOR AIR HANDLING UNITS FOR DUCTLESS SYSTEMS**

- A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, evaporator coil, and controls; wired for single power connection with control transformer.
  - 1. Location: High-wall.
  - 2. Fan: Line-flow fan direct driven by a single motor.
  - 3. Filter return air with washable, antioxidant pre-filter and a pleated anti-allergy enzyme filter.
- B. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
  - 1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
  - 2. Manufacturer: System manufacturer.

## **2.04 OUTDOOR UNITS**

- A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
  - 1. Comply with AHRI 210/240.
  - 2. Refrigerant: R-410A.
  - 3. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
  - 4. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.
- B. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.
  - 1. Condenser Fans: Direct-drive propeller type.
  - 2. Condenser Fan Motor: Enclosed, 1-phase type, permanently lubricated.
- C. Coil: Air-cooled, aluminum fins bonded to copper tubes.
- D. Accessories: Filter drier, high pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
  - 1. Provide thermostatic expansion valves.
- E. Operating Controls:
  - 1. Control by room thermostat to maintain room temperature setting.

2. Low Ambient Kit: Provide refrigerant pressure switch to cycle condenser fan on when condenser refrigerant pressure is above 285 psig and off when pressure drops below 140 psig for operation to 0 degrees F.

## **2.05 ACCESSORY EQUIPMENT**

- A. Room Thermostat: Wall-mounted, electric solid state microcomputer based room thermostat with remote sensor to maintain temperature setting; low-voltage; with following features:
  1. System selector switch (heat-off-cool) and fan control switch (auto-on).
  2. Automatic switching from heating to cooling.
  3. Preferential rate control to minimize overshoot and deviation from setpoint.
  4. Set-up for four separate temperatures per day.
  5. Battery replacement without program loss.
  6. Thermostat Display:
    - a. Actual room temperature.
    - b. Programmed temperature.
    - c. System Mode Indication: Heating, Cooling, Fan Auto, Off, and On, Auto or On, Off.
  7. Manufacturers:
    - a. Carrier Corporation: [www.carrier.com/#sle](http://www.carrier.com/#sle).
    - b. Trane Inc: [www.trane.com/#sle](http://www.trane.com/#sle).
    - c. York International Corporation / Johnson Controls: [www.york.com/#sle](http://www.york.com/#sle).
    - d. Substitutions: Approved equals.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available and in correct location.
- C. Verify that proper fuel supply is available for connection.

### **3.02 INSTALLATION**

- A. Install in accordance with NFPA 90A and NFPA 90B.
- B. Install gas fired furnaces in accordance with NFPA 54.
- C. Provide vent connections in accordance with NFPA 211.

### **END OF SECTION**

## **SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.
- D. Wire pulling lubricant.
- E. Cable ties.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 078443 - Joint Firestopping.
- B. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 262100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conductors.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape 2017.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2021.
- H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.
- J. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.
- K. UL 267 - Outline of Investigation for Wire-Pulling Compounds Most Recent Edition, Including All Revisions.
- L. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.

- M. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.
- N. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.

#### **1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
- C. Wire Pulling Lubricant: Certification of compatibility with conductors/cables where used with the following insulation/jacket types:
- D. Field Quality Control Test Reports.
- E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

#### **1.06 FIELD CONDITIONS**

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

### **PART 2 PRODUCTS**

#### **2.01 CONDUCTOR AND CABLE APPLICATIONS**

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is not permitted.

#### **2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS**

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.

- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductors for Grounding and Bonding: Also comply with Section 260526.
- H. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
- I. 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.
- J. 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. 208Y/120 V, 3 Phase, 4 Wire System:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
      - 4) Neutral/Grounded: White.
    - b. 240/120 V, 1 Phase, 3 Wire System:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Neutral/Grounded: White.
    - c. Equipment Ground, All Systems: Green.

### **2.03 SINGLE CONDUCTOR BUILDING WIRE**

- A. Manufacturers:
  - 1. Copper Building Wire:
    - a. Cerro Wire LLC: [www.cerrowire.com/#sle](http://www.cerrowire.com/#sle).
    - b. Encore Wire Corporation: [www.encorewire.com/#sle](http://www.encorewire.com/#sle).
    - c. General Cable Technologies Corporation: [www.generalcable.com/#sle](http://www.generalcable.com/#sle).
    - d. Southwire Company: [www.southwire.com/#sle](http://www.southwire.com/#sle).
    - e. Substitutions: Approved equals.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
  - 1. Feeders and Branch Circuits:
    - a. Size 10 AWG and Smaller: Solid.
    - b. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:

1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

## **2.04 WIRING CONNECTORS**

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 260526.

## **2.05 ACCESSORIES**

- A. Electrical Tape:
  1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
    - b. Plymouth Rubber Europa: [www.plymouthrubber.com/#sle](http://www.plymouthrubber.com/#sle).
    - c. Substitutions: Approved equals.
  2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
  3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
- B. Wire Pulling Lubricant:
  1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
    - b. American Polywater Corporation: [www.polywater.com/#sle](http://www.polywater.com/#sle).
    - c. Ideal Industries, Inc: [www.idealindustries.com/#sle](http://www.idealindustries.com/#sle).
  2. Listed and labeled as complying with UL 267.
  3. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
  4. Suitable for use at installation temperature.
- C. Cable Ties: Material and tensile strength rating suitable for application.
- D. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for cables and roofing system to be installed; designed to accommodate existing penetrations where applicable.
  1. Products:
    - a. Menzies Metal Products; Electrical Roof Stack and Cap: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - b. Menzies Metal Products; Electrical Retro Box: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - c. Substitutions: Approved equals.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.

- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

### **3.03 INSTALLATION**

- A. Circuiting Requirements:
  - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
  - 2. When circuit destination is indicated without specific routing, determine exact routing required.
- 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. Terminate cables using suitable fittings.
- H. Install conductors with a minimum of 12 inches of slack at each outlet.
- I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- K. Make wiring connections using specified wiring connectors.
  - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
  - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
  - 3. Do not remove conductor strands to facilitate insertion into connector.
  - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

- L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- M. Insulate ends of spare conductors using vinyl insulating electrical tape.
- N. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078443.
- O. 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**



## **SECTION 260526 - 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 RELATED REQUIREMENTS**

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

#### **1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

### **PART 2 PRODUCTS**

#### **2.01 GROUNDING AND BONDING REQUIREMENTS**

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- D. Bonding and Equipment Grounding:
  - 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
  - 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
  - 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
  - 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
  - 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

## **2.02 GROUNDING AND BONDING COMPONENTS**

- A. General Requirements:
  1. Provide products listed, classified, and labeled as suitable for the purpose intended.
  2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
  1. Use insulated copper conductors unless otherwise indicated.
- 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 mechanical connectors or compression connectors 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 260553.

**END OF SECTION**

## **SECTION 260529 - 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 260533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- D. MFMA-4 - Metal Framing Standards Publication 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### **PART 2 PRODUCTS**

#### **2.01 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
  - 1. Comply with the following. Where requirements differ, comply with most stringent.
    - a. NFPA 70.
    - b. Requirements of authorities having jurisdiction.
  - 2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
  - 3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
  - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
  - 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
  - 6. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
  - 7. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.

- b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
  - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
  - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps and clamps suitable for 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. Metal Channel/Strut Framing Systems:
- 1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
  - 2. Comply with MFMA-4.
- D. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
- E. Anchors and Fasteners:
- 1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Equipment Support and Attachment:
  - 1. Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.
  - 2. Use metal channel/strut secured to 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.

- H. Secure fasteners in accordance with manufacturer's recommended torque settings.
- I. Remove temporary supports.

**END OF SECTION**

## **SECTION 260533.13 - CONDUIT FOR ELECTRICAL SYSTEMS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Galvanized steel rigid metal conduit (RMC).
- B. Galvanized steel intermediate metal conduit (IMC).
- C. Liquidtight flexible metal conduit (LFMC).
- D. Galvanized steel electrical metallic tubing (EMT).

#### **1.02 RELATED REQUIREMENTS**

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Cable assemblies consisting of conductors protected by integral metal armor.
- B. Section 260526 - Grounding and Bonding for Electrical Systems.
  - 1. Includes additional requirements for fittings for grounding and bonding.
- C. Section 260529 - Hangers and Supports for Electrical Systems.
- D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

#### **1.03 REFERENCE STANDARDS**

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC) 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S) 2020.
- C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit 2018.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT) 2020.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- G. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit 2018.
- H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
- J. UL 360 - Liquid-Tight Flexible Metal Conduit Current Edition, Including All Revisions.
- K. UL 514A - Metallic Outlet Boxes Current Edition, Including All Revisions.
- L. UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.
- M. UL 797 - Electrical Metallic Tubing-Steel Current Edition, Including All Revisions.
- N. UL 1242 - Electrical Intermediate Metal Conduit-Steel Current Edition, Including All Revisions.

- O. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
  - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
  - 4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
  - 5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

#### **1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
- C. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2-inch (53 mm) trade size and larger.

#### **1.06 QUALITY ASSURANCE**

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

### **PART 2 PRODUCTS**

#### **2.01 CONDUIT APPLICATIONS**

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
- C. Concealed Within Hollow Stud Walls: Use galvanized steel electrical metallic tubing (EMT).
- D. Concealed Above Accessible Ceilings: Use galvanized steel electrical metallic tubing (EMT).
- E. Interior, Damp or Wet Locations: Use galvanized steel intermediate metal conduit (IMC).

- F. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel electrical metallic tubing (EMT).
- G. Exposed, Exterior, Subject to Severe Physical Damage: Use galvanized steel rigid metal conduit (RMC).
  - 1. Exterior locations subject to severe physical damage include, but are not limited to:
    - a. Where exposed below 20 feet..
- H. Flexible Connections to Vibrating Equipment:
  - 1. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).
  - 2. Maximum Length: 6 feet unless otherwise indicated.

## **2.02 CONDUIT - GENERAL REQUIREMENTS**

- A. Comply with NFPA 70.
- B. Fittings for Grounding and Bonding: See Section 260526 for additional requirements.
- C. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- D. Provide products listed, classified, and labeled as suitable for purpose intended.
- E. Minimum Conduit Size, Unless Otherwise Indicated:
  - 1. Branch Circuit Homeruns: 3/4-inch trade size.
  - 2. Flexible Connections to Luminaires: 3/8-inch trade size.
- F. 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. Manufacturers:
  - 1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).
  - 2. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  - 3. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  - 4. Substitutions: Approved equals.
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.us/#sle](http://www.alliedeg.us/#sle).
    - c. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - d. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - e. Substitutions: Approved equals.
  - 2. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
  - 3. Material: Use steel or malleable iron.
    - a. Where not subject to severe corrosive influence, stainless steel or aluminum fittings may be used.
  - 4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.



## 2.04 GALVANIZED STEEL INTERMEDIATE METAL CONDUIT (IMC)

- A. Manufacturers:
  - 1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).
  - 2. Nucor Tubular Products: [www.nucortubular.com/#sle](http://www.nucortubular.com/#sle).
  - 3. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  - 4. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  - 5. Substitutions: Approved equals.
- B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.
- C. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.us/#sle](http://www.alliedeg.us/#sle).
    - c. Bridgeport Fittings, LLC: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - d. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - e. Substitutions: See Section 016000 - Product Requirements.
  - 2. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 1242.
  - 3. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.
  - 4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.
  - 5. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
  - 6. Nonhazardous Locations: Use boxes and fittings listed and labeled as complying with UL 514A, UL 514B, or UL 6.
  - 7. Material: Use steel or malleable iron.
  - 8. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil, 0.040 inch.

## 2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Manufacturers:
  - 1. AFC Cable Systems, a division of Atkore International: [www.afcweb.com/#sle](http://www.afcweb.com/#sle).
  - 2. International Metal Hose: [www.metalhose.com/#sle](http://www.metalhose.com/#sle).
  - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- C. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Bridgeport Fittings, LLC: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - c. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - d. Substitutions: Approved equals.
  - 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 3. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.

## 2.06 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
  - 1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).
  - 2. Nucor Tubular Products: [www.nucortubular/#sle](http://www.nucortubular/#sle).
  - 3. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  - 4. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  - 5. Substitutions: Approved equals.
- B. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- C. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.us/#sle](http://www.alliedeg.us/#sle).
    - c. Bridgeport Fittings, LLC: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - d. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - e. Substitutions: Approved equals.
  - 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 3. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.
  - 4. Connectors and Couplings: Use compression/gland or set-screw type.
    - a. Do not use indenter type connectors and couplings.

## 2.07 ACCESSORIES

- A. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.
- B. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.
- C. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.
  - 1. Products:
    - a. Menzies Metal Products; Electrical Roof Stack and Cap: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - b. Menzies Metal Products; Electrical Retro Box: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - c. Substitutions: Approved equals.
- D. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Install intermediate metal conduit (IMC) in accordance with NECA 101.
- E. Conduit Routing:
  - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
  - 2. When conduit destination is indicated without specific routing, determine exact routing required.
  - 3. Conceal conduits unless specifically indicated to be exposed.
  - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
    - a. Electrical rooms.
    - b. Mechanical equipment rooms.
    - c. Within joists in areas with no ceiling.
  - 5. Unless otherwise approved, do not route exposed conduits:
    - a. Across floors.
    - b. Across roofs.
    - c. Across top of parapet walls.
    - d. Across building exterior surfaces.
  - 6. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
  - 7. Arrange conduit to maintain adequate headroom, clearances, and access.
  - 8. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
  - 9. Arrange conduit to provide no more than 150 feet between pull points.
  - 10. Route conduits above water and drain piping where possible.
  - 11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
  - 12. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
  - 13. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    - a. Heaters.
    - b. Hot water piping.
  - 14. Group parallel conduits in same area on common rack.
- F. Conduit Support:
  - 1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 260529.
  - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
  - 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
  - 4. Use conduit strap to support single surface-mounted conduit.

- a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
  5. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
  6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
  7. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.
  8. Use nonpenetrating rooftop supports to support conduits routed across rooftops, where approved.
  9. Use of spring steel conduit clips for support of conduits is not permitted.
  10. Use of wire for support of conduits is not permitted.
  11. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.
- G. 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, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
  7. Secure joints and connections to provide mechanical strength and electrical continuity.
- H. 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. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
  6. 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.
  7. Provide metal escutcheon plates for conduit penetrations exposed to public view.
  8. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078443.
- I. Underground Installation:
1. Provide underground warning tape along entire conduit length for service entrance where not concrete-encased; see Section 260553.

- J. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
  - 1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
  - 2. Where conduits are subject to earth movement by settlement or frost.
- K. Conduit Sealing:
  - 1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
    - a. Where conduits enter building from outside.
    - b. Where service conduits enter building from underground distribution system.
    - c. Where conduits enter building from underground.
    - d. Where conduits may transport moisture to contact live parts.
  - 2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
    - a. Where conduits pass from outdoors into conditioned interior spaces.
    - b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- L. Provide grounding and bonding; see Section 260526.

### **3.03 FIELD QUALITY CONTROL**

- A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- B. Correct deficiencies and replace damaged or defective conduits.

### **3.04 CLEANING**

- A. Clean interior of conduits to remove moisture and foreign matter.

### **3.05 PROTECTION**

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

**END OF SECTION**

## **SECTION 260583 - WIRING CONNECTIONS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Electrical connections to equipment.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 262816.16 - Enclosed Switches.

#### **1.03 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
  - 2. Determine connection locations and requirements.
- B. Sequencing:
  - 1. Install rough-in of electrical connections before installation of equipment is required.
  - 2. Make electrical connections before required start-up of equipment.

#### **1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Disconnect Switches: As specified in Section 262816.16 and in individual equipment sections.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that equipment is ready for electrical connection, wiring, and energization.

#### **3.02 ELECTRICAL CONNECTIONS**

- A. Make electrical connections in accordance with equipment manufacturer's instructions.

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

**END OF SECTION**

## **SECTION 262816.16 - ENCLOSED SWITCHES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Enclosed safety switches.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 260526 - Grounding and Bonding for Electrical Systems.
- B. Section 260529 - Hangers and Supports for Electrical Systems.

#### **1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- C. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems 2021.
- D. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- F. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- G. UL 98 - Enclosed and Dead-Front Switches Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
  - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
  - 3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
  - 4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
- C. Field Quality Control Test Reports.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.



### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

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

### **1.08 FIELD CONDITIONS**

- A. Maintain ambient temperature between -22 degrees F and 104 degrees F during and after installation of enclosed switches.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. ABB/GE: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
- B. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
- C. Schneider Electric; Square D Products: [www.schneider-electric.us/#sle](http://www.schneider-electric.us/#sle).
- D. Siemens Industry, Inc: [www.usa.siemens.com/#sle](http://www.usa.siemens.com/#sle).
- E. Substitutions: Approved equals.
- F. Source Limitations: Furnish enclosed switches and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

### **2.02 ENCLOSED SAFETY SWITCHES**

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
  - 1. Altitude: Less than 6,600 feet.
  - 2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
  - 1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Conductor Terminations: Suitable for use with the conductors to be installed.
- I. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.

- J. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- K. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
  - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
    - a. Indoor Clean, Dry Locations: Type 1.
    - b. Outdoor Locations: Type 3R.
  - 2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.
- L. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 260529.
- E. Install enclosed switches plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 260526.

#### **3.03 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 7.5.1.1.
- C. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

#### **3.04 ADJUSTING**

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

#### **3.05 CLEANING**

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.

- B. Repair scratched or marred exterior surfaces to match original factory finish.

**END OF SECTION**



## **PROJECT PLANS/DRAWINGS**

Bid Ref #: 91038-011.0



# CENTRAL COUNTY TRANSPORTATION AUTHORITY KMETRO HISTORIC DEPOT

459 N. BURDICK ST.

KALAMAZOO, MI 49007



**WIGHTMAN**

433 E. RANSOM ST.  
KALAMAZOO, MI 49007  
269.327.3532

www.gowightman.com

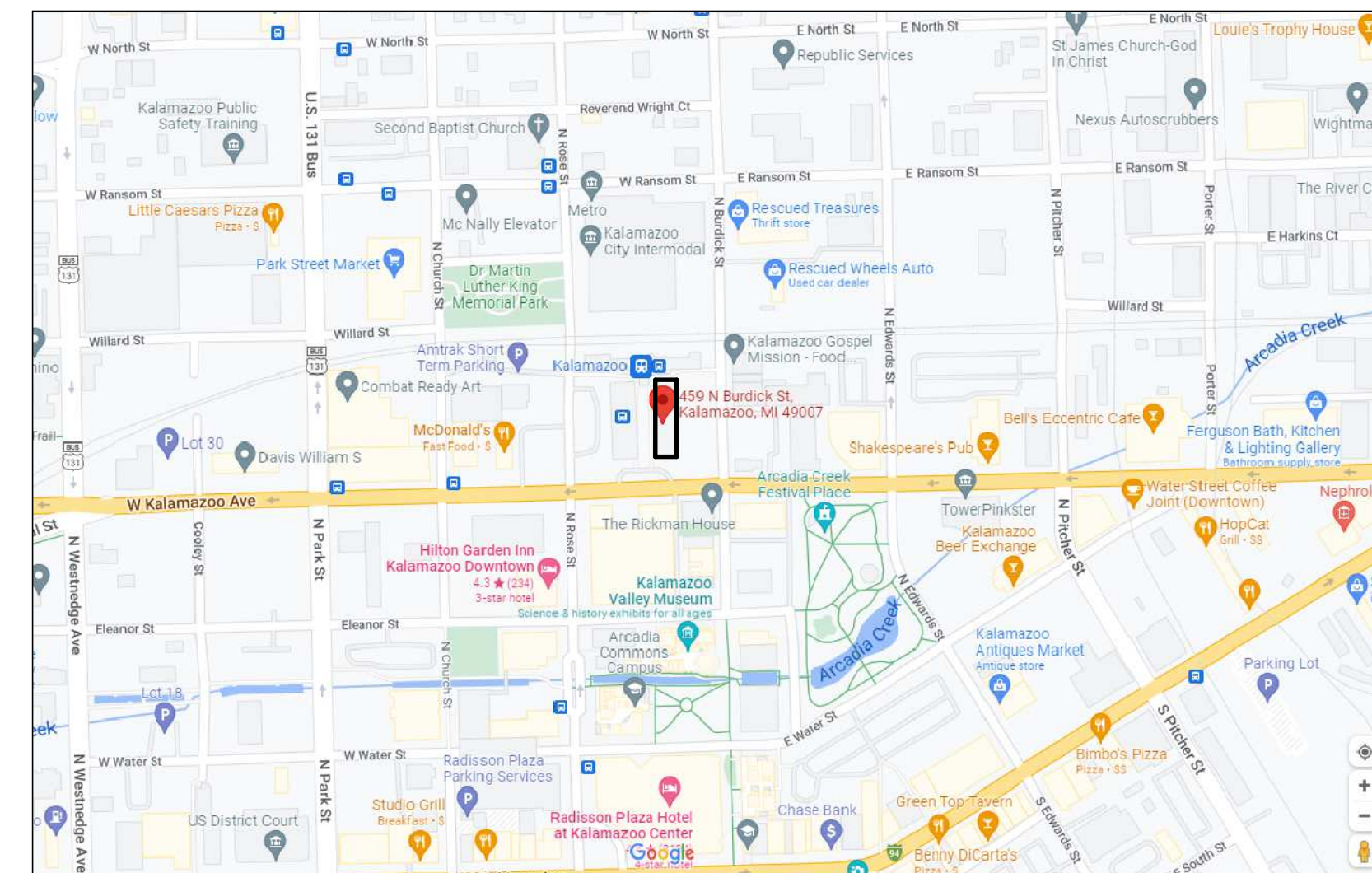
## ABBREVIATIONS

A.B. ANCHOR BOLTS  
A.C.T. ACOUSTICAL COMPOSITE TILE  
A.F.F. ABOVE FINISHED FLOOR  
A.F.G. ABOVE FINISHED GRADE  
ALT. ALTERNATE  
ALUM. ALUMINUM  
AUX. AUXILIARY  
B.F.C. BELOW FINISHED CEILING  
B.O. BOTTOM OF  
BD. BOARD  
BLDG. BUILDING  
BLK'G. BLOCKING  
BM. BEAM  
BTM. BOTTOM  
C. CONCUIT  
C.W. COLD WATER  
CL. CENTER LINE  
CLG. CEILING  
COL. COLUMN  
CONC. CONCRETE  
CONN. CONNECTION  
CONT. CONTINUOUS  
CONTR. CONTRACTOR  
CPT. CARPET  
CTR. CENTER  
DBL. DOUBLE  
DIA. DIAMETER  
DN. DOWN  
DWG. DRAWING  
E.F. EXHAUST FAN  
E.W. EACH WAY  
EL. ELEVATION  
ELEV. ELEVATION  
EQ. EQUAL  
EQUIP. EQUIPMENT  
EX. EXHAUST  
EXIST. EXISTING  
EXT. EXTERIOR  
F.D. FLOOR DRAIN  
F.O.M. FACE OF MASONRY  
F.O.S. FACE OF STUD  
F.P.H.B. FREEZE POINT OF HOSE BIBB  
FIN. FL. FINISHED FLOOR  
FND. FOUNDATION  
FRP. FIBERGLASS REINFORCED PANEL  
FT. FOOT  
FTG. FOOTING  
G.C. GENERAL CONTRACTOR  
GA. GAUGE  
GAL. GALLON  
GALV. GALVANIZED  
GPM. GALLONS PER MINUTE  
GRD. GROUND  
GYP. GYPSUM BOARD  
BD. BOARD  
H.M. HOLLOW METAL  
H.P. HORSE POWER, HIGH POINT  
H.W. HOT WATER  
HORIZ. HORIZONTAL  
HT. HEIGHT  
INUSL. INSULATION  
J.C. JANITORS CLOSET  
L.P. LOW POINT  
LAM. LAMINATE  
LAV. LAVATORY  
LG. LONG  
LLH. LONG LEG HORIZONTAL  
LLV. LONG LEG VERTICAL

## ABBREVIATIONS

LOC. LOCATE  
MAS. MASONRY  
MAX. MAXIMUM  
MDP. MODIFIED PROCTOR  
MECH. MECHANICAL  
MFR. MANUFACTURERS  
MFR. MANUFACTURERS  
MIN. MINIMUM  
MTD. MOUNTED  
MTL. METAL  
N.I.C. NOT IN CONTRACT  
NA. NOT APPLICABLE  
O.C. ON CENTER  
O.D. OUTSIDE DIMENSION  
O.H. OVERHANG  
O/O. OUT TO OUT  
OSB. ORIENTED STRAND BOARD  
P.R. PROXIMITY READER  
P.T. PRESSURE TREATED  
PL. PLATE  
PLYWD. PLYWOOD  
PLWD. PLATE  
PRE-FA. PREFABRICATED  
B. BATT  
PRE-FIN. PREFINISHED  
PSF. POUNDS PER SQUARE FOOT  
PSI. POUNDS PER SQUARE INCH  
PTN. PARTITION  
PVC. POLYVINYL CHLORIDE  
R.D. ROOF DRAIN  
R.O. ROUGH OPENING  
RECEPT. RECEPTACLE  
REIN. REINFORCING  
RM. ROOM  
S.S. STAINLESS STEEL  
S.V. SHEET VINYL  
SQ. SQUARE  
STL. STEEL  
STRUC. STRUCTURAL  
SURF. SURFACE MOUNTED  
T&G. TONGUE AND GROOVE  
T.C. TOP OF CURVE  
T.O.F. TOP OF FOOTING  
T.O.S. TOP OF SLAB  
T.O.W. TOP OF WALKWAY  
TYP. TYPICAL  
U.D. UNIT DIMENSION  
U.N.O. UNLESS NOTED OTHERWISE  
V.B. VAPOR BARRIER  
V.T.R. VENT THRU ROOF  
VCT. VINYL COMPOSITE TILE  
VEN. VENEER  
VERT. VERTICAL  
VEST. VESTIBULE  
W. WIDE, WASTE  
W.C. WATER CLOSET  
W.C.O. WALL CLEAN OUT  
W.H. WATER HEATER  
W.P. WATER PROOF  
W.W.F. WELDED WIRE FABRIC  
W.W.M. WELDED WIRE MESH  
w. WITH  
WD. WOOD

## LOCATION MAP



## PROJECT DESCRIPTION:

THIS PROJECT INVOLVES INSULATING THE EXISTING ATTIC OF THE HISTORIC TRAIN & BUS DEPOT BUILDING LOCATED AT 459 N. BURDICK ST. KALAMAZOO, MICHIGAN. THE SCOPE OF WORK INCLUDES APPLYING MINIMUM 2" OF CLOSED CELL SPRAY-ON FOAM INSULATION BETWEEN ROOF RAFTERS, COVERING UNUSED LOUVERS AS INDICATED ON THE PLANS, AND THE INSTALLATION OF TWO NEW MINI-SPLIT MECHANICAL UNITS IN THE ATTIC SPACE WITH A WALL MOUNTED CONDENSING UNIT AS SHOWN ON THE DRAWINGS. ALL MECHANICAL AND ELECTRICAL DEVICES INCLUDING MECHANICAL UNITS AND ELECTRICAL PANELS SHALL BE PROTECTED DURING THE PERFORMANCE OF THE SCOPE OF WORK.

## GENERAL NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LOCAL, STATE, AND COUNTY CODES / ORDINANCES AND BUILDING REGULATIONS OF THE CITY OF KALAMAZOO / OSHA / AND THE INSTRUCTIONS OF INSPECTING AUTHORITIES.
- TIME IS OF THE ESSENCE OF THE CONTRACT. ALL WORK SHALL PROCEED AS EXPEDITIOUSLY AS POSSIBLE IN A WORKMANLIKE MANNER.
- CONTRACTOR SHALL VISIT THE PREMISES AND SHALL BE THOROUGHLY ACQUAINTED WITH THE CONDITIONS TO BE ENCOUNTERED. AS NO EXTRA COSTS WILL BE ALLOWED TO COVER WORK WHICH THE CONTRACTOR HAS NOT INCLUDED IN HIS TENDER DUE TO HIS FAILURE TO THOROUGHLY EXAMINE THE PREMISES.
- THE BIDDER SHALL PROMPTLY NOTIFY THE ARCHITECT OF ANY AMBIGUITY, INCONSISTENCY OR ERROR WHICH HE MAY DISCOVER UPON EXAMINATION OF THE BIDDING DOCUMENTS OR OF THE SITE.
- SUBMISSION OF BID INDICATES THE CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED AS PER DRAWINGS AND SPECIFICATIONS.
- CONTRACTOR SHALL INCLUDE COSTS OF ALL PERMIT AND FEES IN BASE BID.
- ALL SUBSTITUTIONS SHALL BE APPROVED BY ARCHITECT/OWNER PRIOR TO BIDDING.
- DO NOT SCALE DRAWINGS, USE ONLY THE DIMENSIONS PROVIDED.
- VERIFY ALL DIMENSIONS, FIELD MEASUREMENTS AND CONDITIONS IN FIELD BEFORE THE START OF CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ARCHITECT IMMEDIATELY.
- GENERAL CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THIS PROJECT, INCLUDING ALL NECESSARY SIGNS, BARRIERS AND SUPERVISION.
- CONTRACTORS SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, TOOLS, TRANSPORTATION, ETC. FOR A COMPLETE & PROPER COMPLETION OF THE PROJECT AS INDICATED ON THE DRAWINGS & AS SPECIFIED HEREIN AND/OR AS REQUIRED.
- THE CONTRACTOR SHALL PROVIDE NECESSARY BARRIERS AND PROTECTION ENCLOSURES AS REQUIRED TO ALLOW THE OWNER'S NORMAL AND SAFE USE OF SITE PARKING AND BUILDING PREMISES.
- DURING CONSTRUCTION, MAINTAIN EXISTING MEANS OF EGRESS AND PASSAGEWAYS CLEAR OF OBSTRUCTIONS. TAKE ALL PRECAUTIONS NECESSARY TO INSURE THE SAFETY OF THE GENERAL PUBLIC AND WORKERS.
- GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT ADJACENT PRIVATE AND PUBLIC PROPERTY FROM DAMAGE DURING CONSTRUCTION.
- ALL COLOR SELECTIONS SHALL BE BY THE OWNER/ ARCHITECT.
- THE LOCATION OF ALL UTILITIES AND IMPROVEMENTS INDICATED HEREIN ARE APPROXIMATE ONLY AND WERE FROM SOURCES BELIEVED TO BE RELIABLE, BUT NO GUARANTEE IS EXPRESSED OR IMPLIED AS TO LOCATION, TYPE OR EXTENT OF UTILITIES OR IMPROVEMENTS WHETHER OR NOT SAME ARE INDICATED OR SHOWN, AND THIS CONTRACTOR SHALL MAKE HIS OWN INVESTIGATION AS TO THE EXTENT OF THESE OR OTHER UTILITIES, AND SHALL BE RESPONSIBLE FOR PROTECTION AND RESTORATION OF SAME IF DAMAGED AS A RESULT OF HIS OPERATIONS.
- CONSULT WITH OWNER REGARDING STORAGE OF ON SITE MATERIALS AND ACCESS TO SITE AS NOT TO INTERFERE WITH NORMAL OPERATIONS.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT.
- ALL EXISTING CONSTRUCTION, EQUIPMENT AND FINISHES TO REMAIN SHALL BE PROTECTED DURING CONSTRUCTION.
- WHERE EXISTING FINISHED SURFACES TO REMAIN ARE DAMAGED BY NEW CONSTRUCTION, THE CONTRACTOR SHALL POINT, TUCK, REPAIR OR OTHERWISE REPLACE DAMAGED SURFACES AS REQUIRED.
- WHERE EXISTING EQUIPMENT TO REMAIN IS DAMAGED BY NEW CONSTRUCTION, THE CONTRACTOR SHALL REPAIR OR REPLACE THE DAMAGED EQUIPMENT OR COMPENSATE THE OWNER TO HIS SATISFACTION.
- FIELD VERIFY ITEMS TO BE DEMOLISHED. ANY DISCREPANCIES OR QUESTIONABLE ITEMS SHOULD BE BROUGHT TO THE OWNER/ARCHITECT'S ATTENTION IMMEDIATELY.
- GENERAL CONTRACTOR SHALL REMOVE ALL DEBRIS FROM SITE AND LEGALLY DISPOSE OF.
- ALL BROCHURES, OPERATING MANUALS, SHOP DRAWINGS, CATALOGS, ETC., SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE JOB. CONTRACTOR SHALL PROVIDE OWNER WITH COMPLETE SET OF "AS-BUILT" DRAWINGS AT COMPLETION OF JOB.
- FIELD CHECK ALL DIMENSIONS. THE CONTRACTOR SHALL EXAMINE AND FIELD VERIFY ALL EXISTING AND GIVEN DIMENSIONS AND CONDITIONS PRIOR TO COMMENCEMENT OF THE WORK AND FABRICATION OF CONSTRUCTION MATERIALS. VARIANCES FROM THE DRAWINGS AND SPECIFICATIONS AND POTENTIAL INTERFERENCES SHALL BE REPORTED PROMPTLY TO THE ARCHITECT. THE CONTRACTOR SHALL INCORPORATE ACTUAL FIELD CONDITIONS AND DIMENSIONS IN THE WORK AND SHALL INDICATE CHANGES AND ADJUSTMENTS ON DRAWINGS SUBMITTED FOR APPROVAL. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO THE CONSTRUCTION DETAILS. MATERIAL QUANTITIES AND EXTENT OF THE CONSTRUCTION WORK SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PERFORM THE WORK TO MEET FIELD CONDITIONS ENCOUNTERED.
- CAULK AROUND ALL WALL PENETRATIONS.
- CONTRACTOR SHALL PROVIDE A WRITTEN GUARANTEE THAT WILL BE MADE GOOD AT CONTRACTORS OWN EXPENSE FOR ANY IMPERFECTIONS IN MATERIAL AND/OR WORKMANSHIP WHICH MY DEVELOP WITHIN (1) ONE YEAR FROM FINAL ACCEPTANCE. FURTHER, THIS CONTRACTOR SHALL OBTAIN WRITTEN GUARANTEES FROM ALL MANUFACTURERS STATING ON WHAT OPERATING CONDITIONS & PERFORMANCE CAPACITIES EACH EQUIPMENT PIECE GUARANTEE IS BASED.
- IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.

SHEET LIST	
SHEET NO.	SHEET TITLE
G100	TITLE SHEET
A101	FLOOR PLANS
A300	BUILDING SECTIONS
A301	BUILDING SECTIONS
A400	WALL SECTIONS
A900	PHOTOGRAPH PLAN & PHOTOGRAPHS
ME101	MECHANICAL AND ELECTRICAL FLOOR PLAN
M500	MECHANICAL SCHEDULE AND DETAILS

LEGAL TABLE	
LEGAL JURISDICTION:	KALAMAZOO, MICHIGAN
BUILDING CODE:	2015 MICHIGAN BUILDING CODE
MECHANICAL CODE:	2015 MICHIGAN MECHANICAL CODE
PLUMBING CODE:	2015 MICHIGAN PLUMBING CODE
ELECTRICAL CODE:	2017 MICHIGAN ELECTRIC CODE
FIRE CODE:	
TYPE OF CONSTRUCTION:	IB
EXISTING BUILDING AREA:	SECOND LEVEL: +/- 5,000 SQ. FT.
OCCUPANT LOAD:	TBD SF./OCC.

## CONTACT INFORMATION:

**OWNER:**  
CENTRAL COUNTY TRANSPORTATION AUTHORITY  
530 N. ROSE STREET  
KALAMAZOO, MI 49007  
PHONE: (269) 337-8235  
CONTACT: ROB BRANCH,  
DEPUTY DIRECTOR OF FLEET AND FACILITIES

**BUILDING OFFICIAL:**  
CITY OF KALAMAZOO  
245 N. ROSE STREET, STE 100  
KALAMAZOO, MI 49007  
PHONE: (269) 337-8000  
CONTACT: ROGER IVESON  
EMAIL: COKDEVELOPMENTCENTER@KALAMAZOOCITY.ORG

**ARCHITECT/ENGINEER:**  
WIGHTMAN & ASSOCIATES, INC.  
2303 PIPESTONE RD  
BENTON HARBOR, MI 49022  
CONTACT: EMMANUEL KOLLIAS  
PHONE: (734) 658-7581  
EMAIL: EKOLLIAS@GOWIGHTMAN.COM

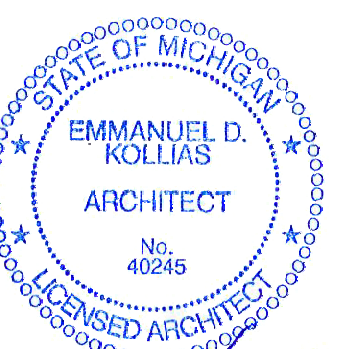
**MECHANICAL/ELECTRICAL ENGINEER:**  
STEELHEAD ENGINEERING COMPANY  
259 E. MICHIGAN AVENUE  
KALAMAZOO, MI 49007  
PHONE: (269) 585-2255  
CONTACT:  
EMAIL:

PROJECT NAME:

**KMETRO HISTORIC DEPOT**

459 N. BURDICK ST.  
KALAMAZOO, MI 49007

**CENTRAL COUNTY TRANSPORTATION AUTHORITY**  
530 NORTH ROSE STREET  
KALAMAZOO, MI 49007



*Emmanuel Kollias*

2 ISSUED FOR 09.06.2022  
PERMITS/ BID  
1 60% REVIEW 07.27.2022

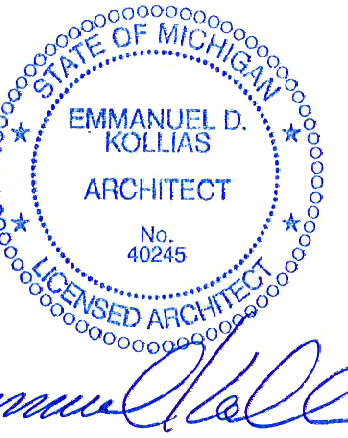
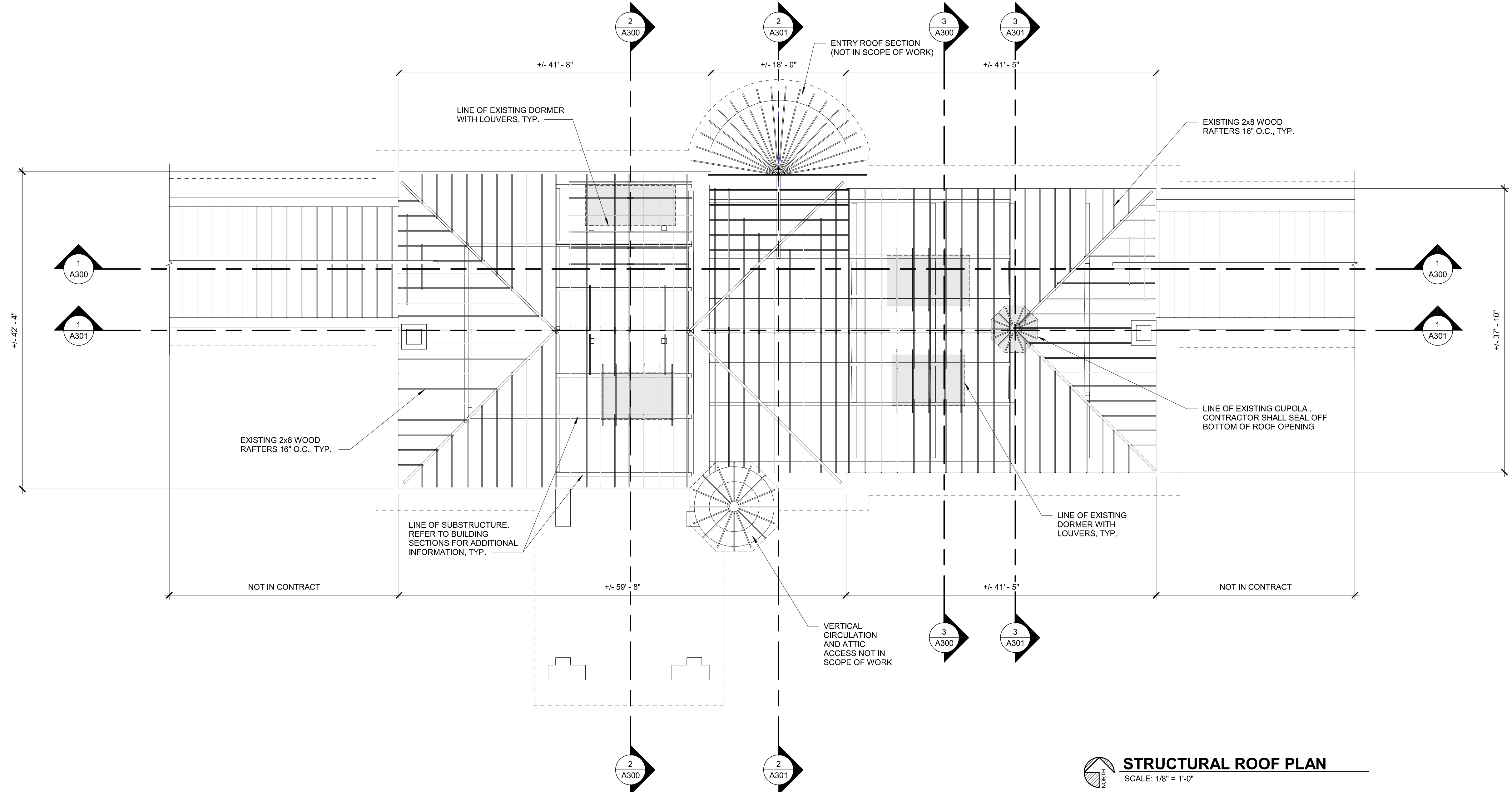
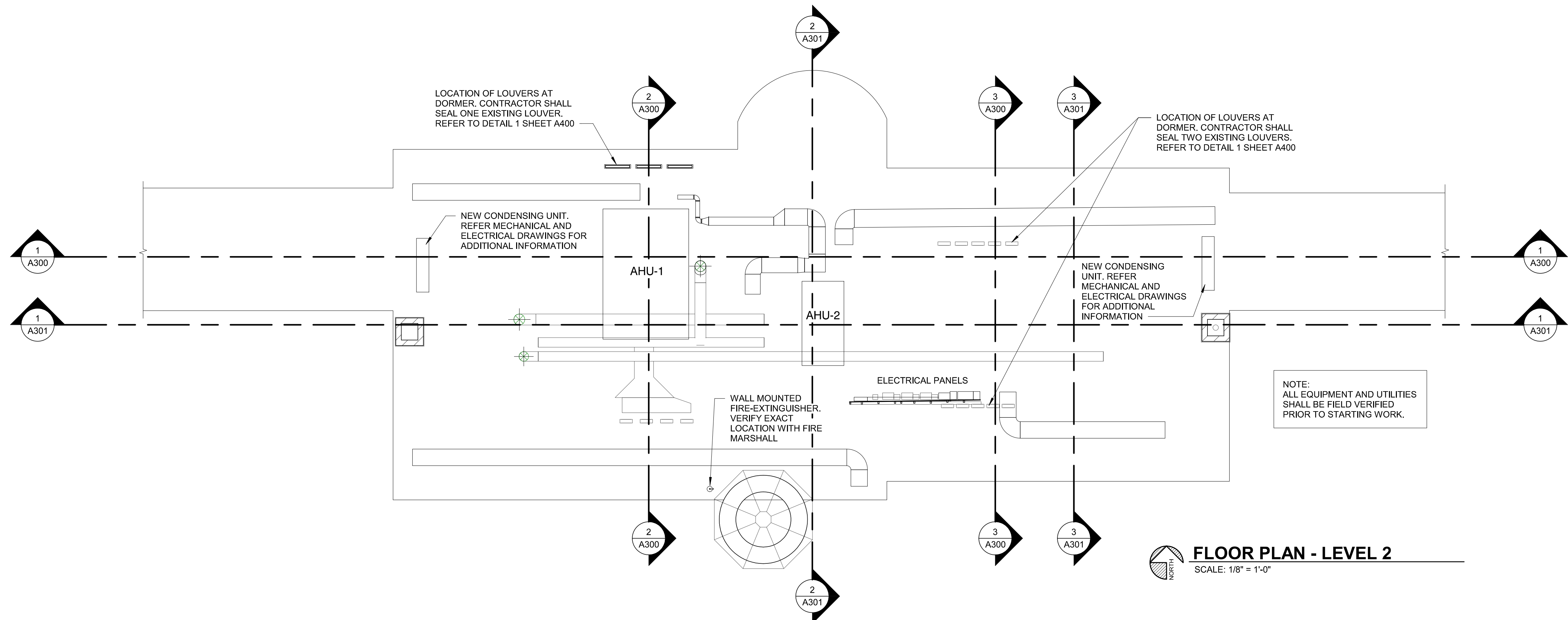
## REVISIONS

DATE: Issue Date  
SCALE: 1/4" = 1'-0"

TITLE SHEET

JOB No. 224096  
**G100**





2	ISSUED FOR PERMITS/ BID	09.06.2022
1	60% REVIEW	07.27.2022
<b>REVISIONS</b>		
DATE: Issue Date		
SCALE: 1/8" = 1'-0"		



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PROJECT NAME:

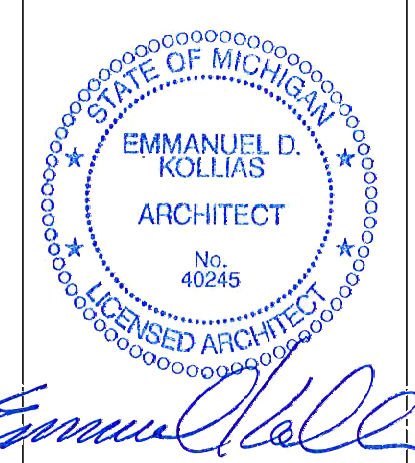
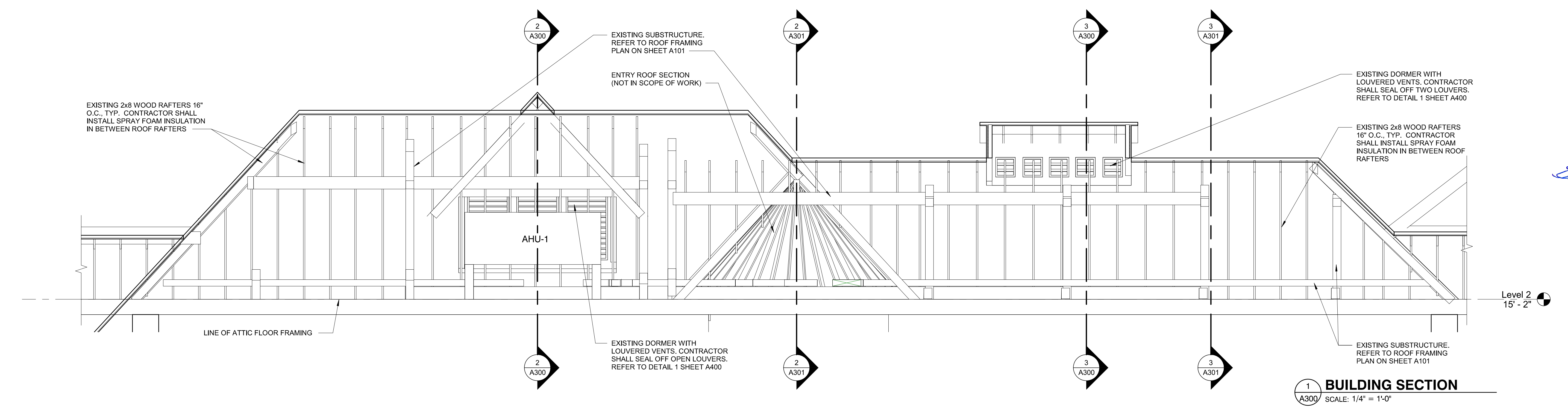
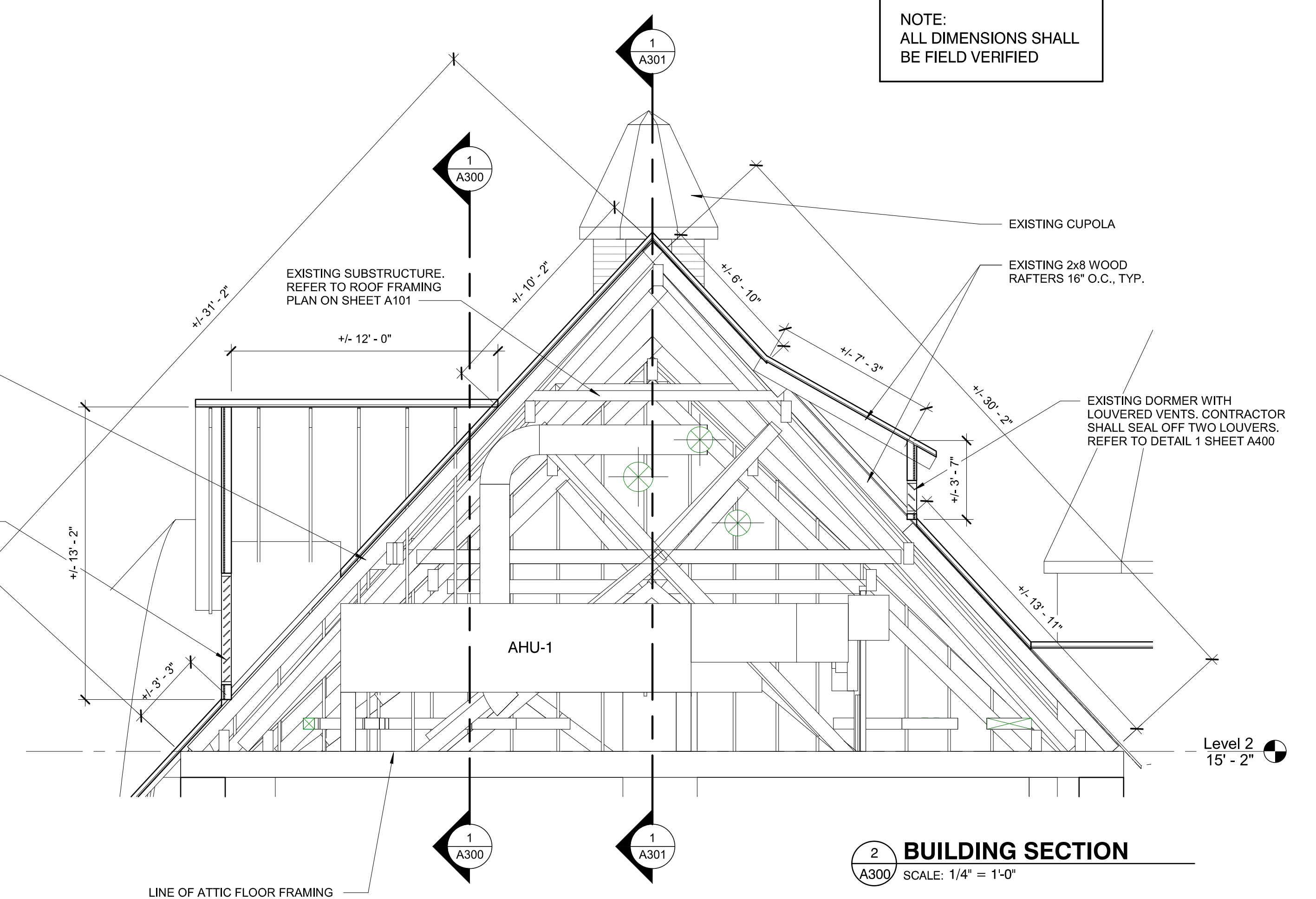
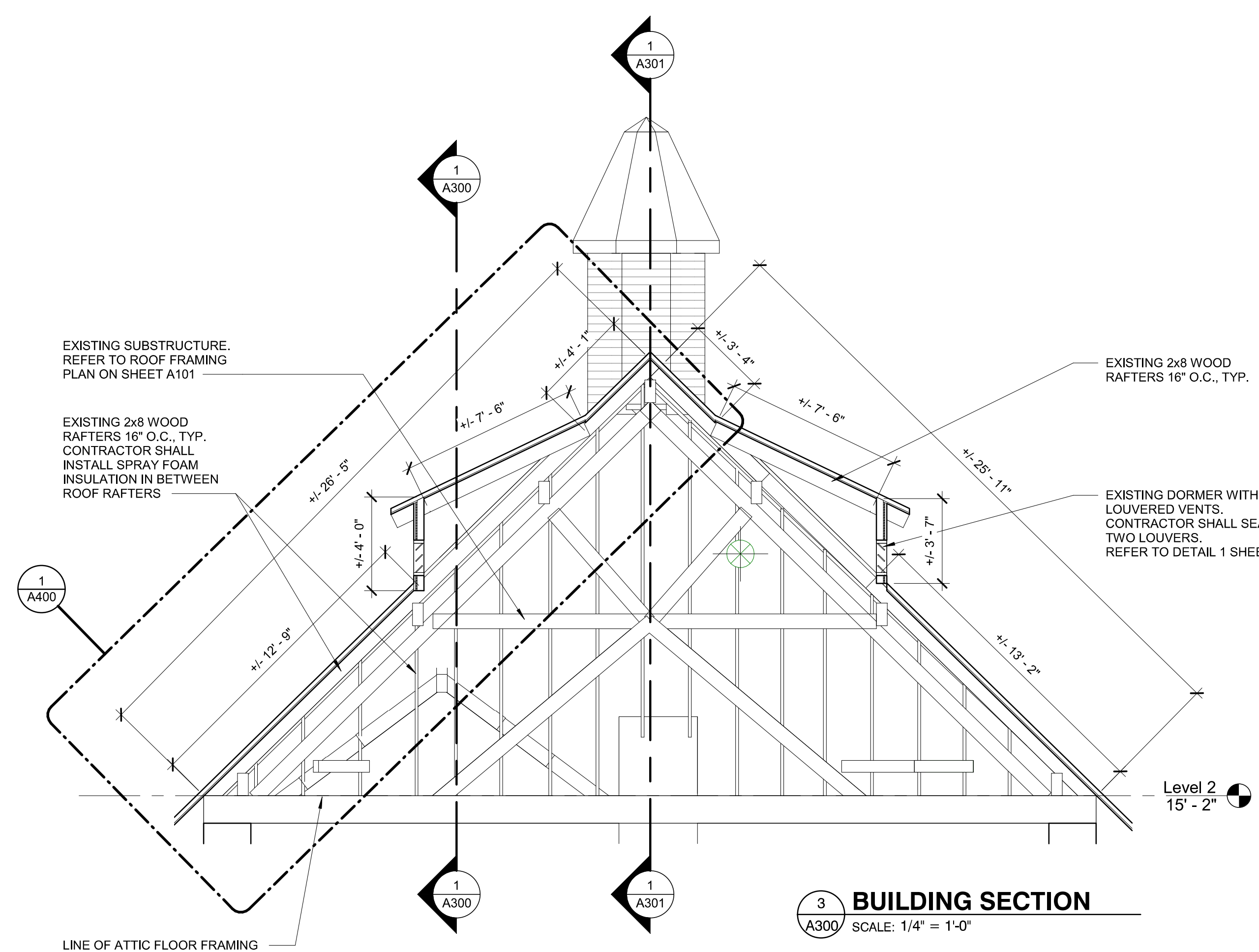
**KMETRO HISTORIC DEPOT**

459 N. BURDICK ST.  
KALAMAZOO, MI 49007

**CENTRAL COUNTY TRANSPORTATION AUTHORITY**

530 NORTH ROSE STREET  
KALAMAZOO, MI 49007

NOTE:  
ALL DIMENSIONS SHALL  
BE FIELD VERIFIED



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**REVISIONS**

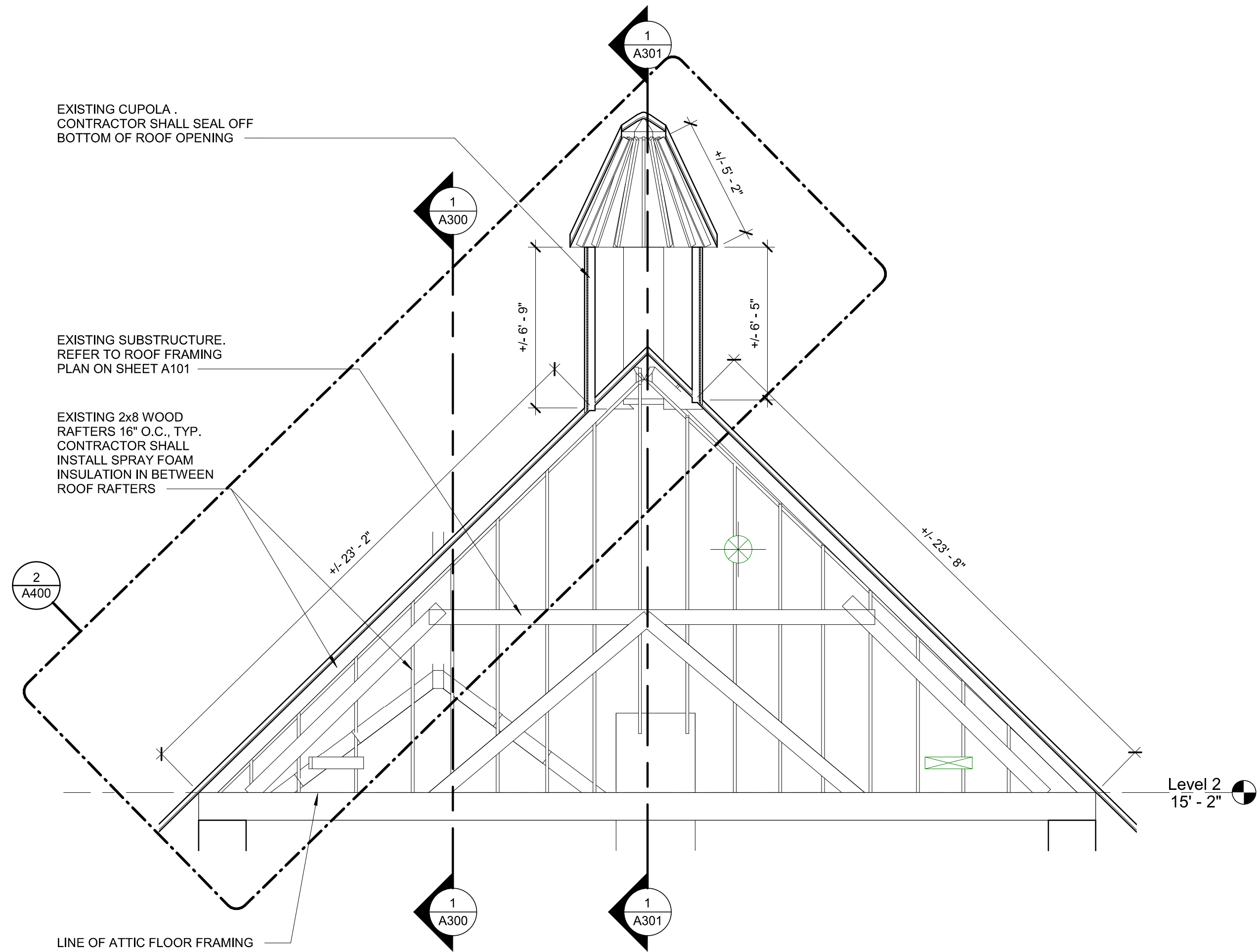
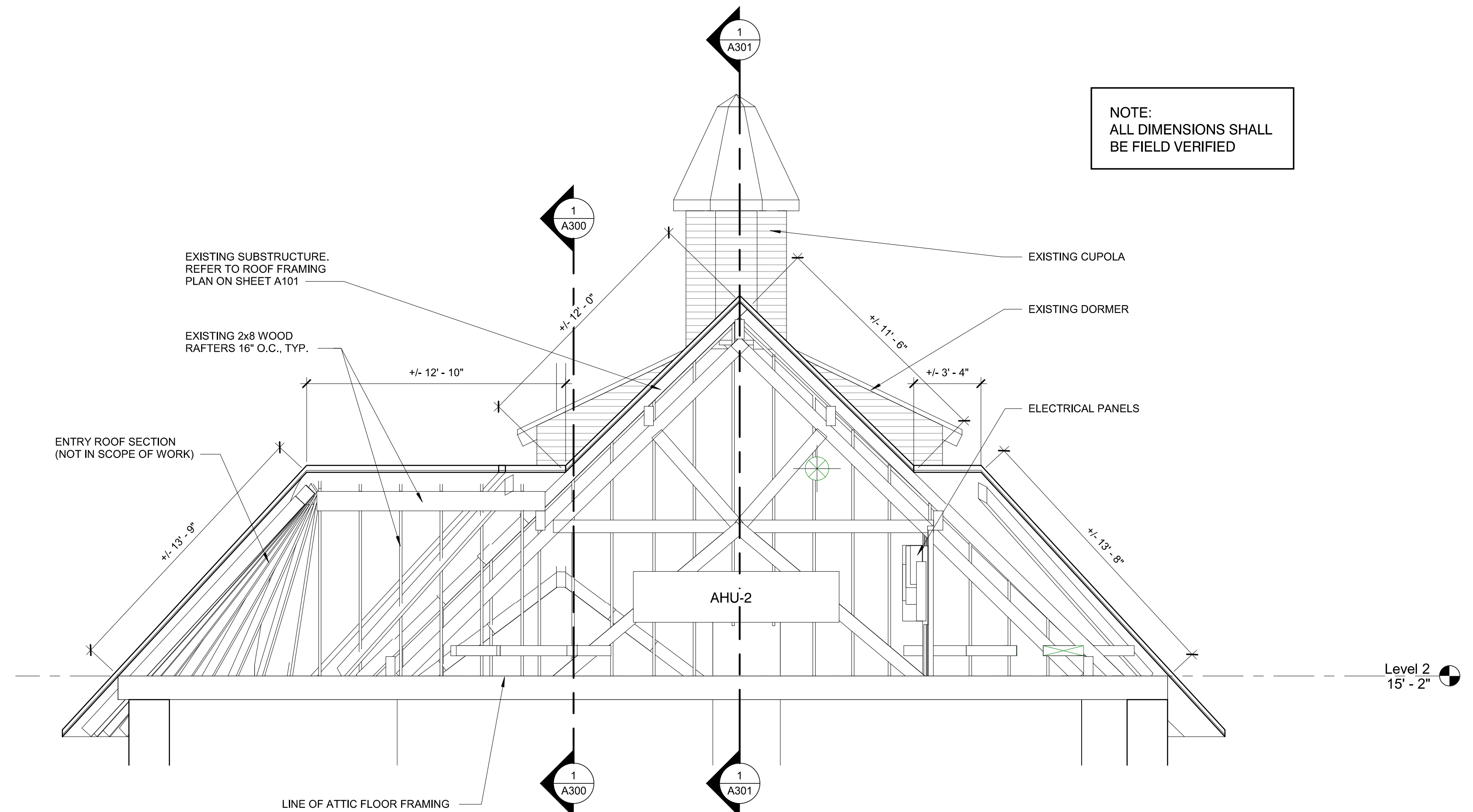
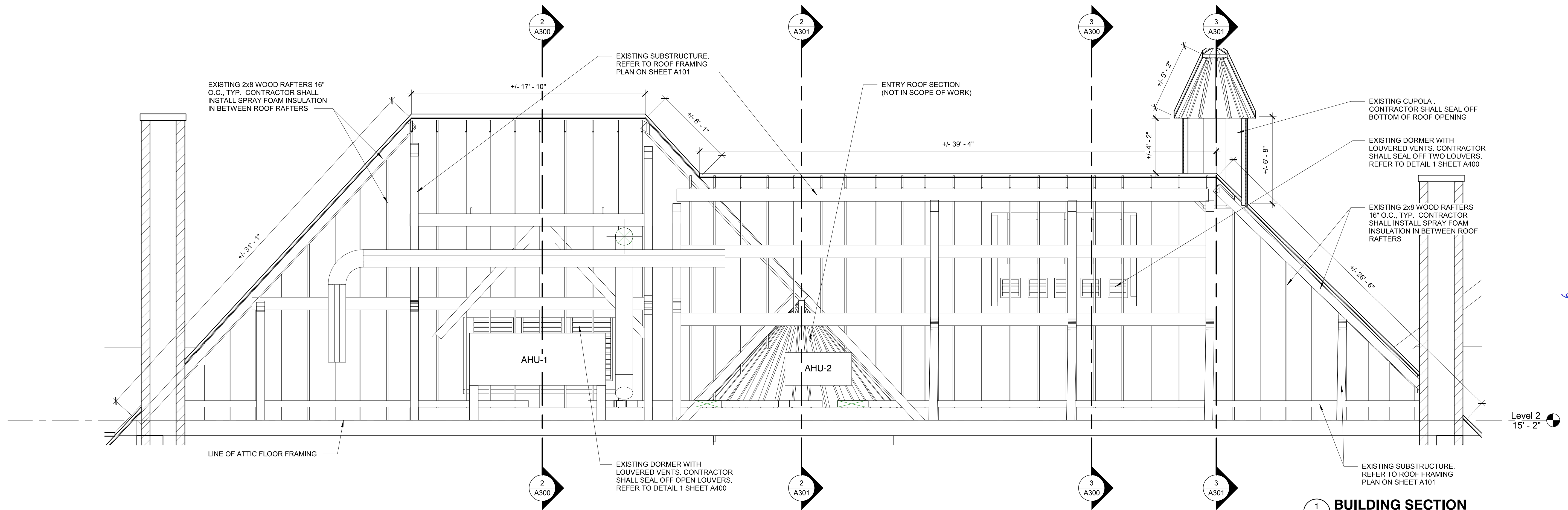
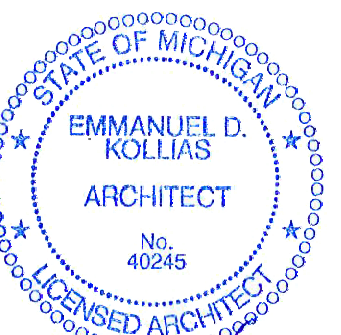
DATE: Issue Date

SCALE: 1/4" = 1'-0"

BUILDING SECTIONS

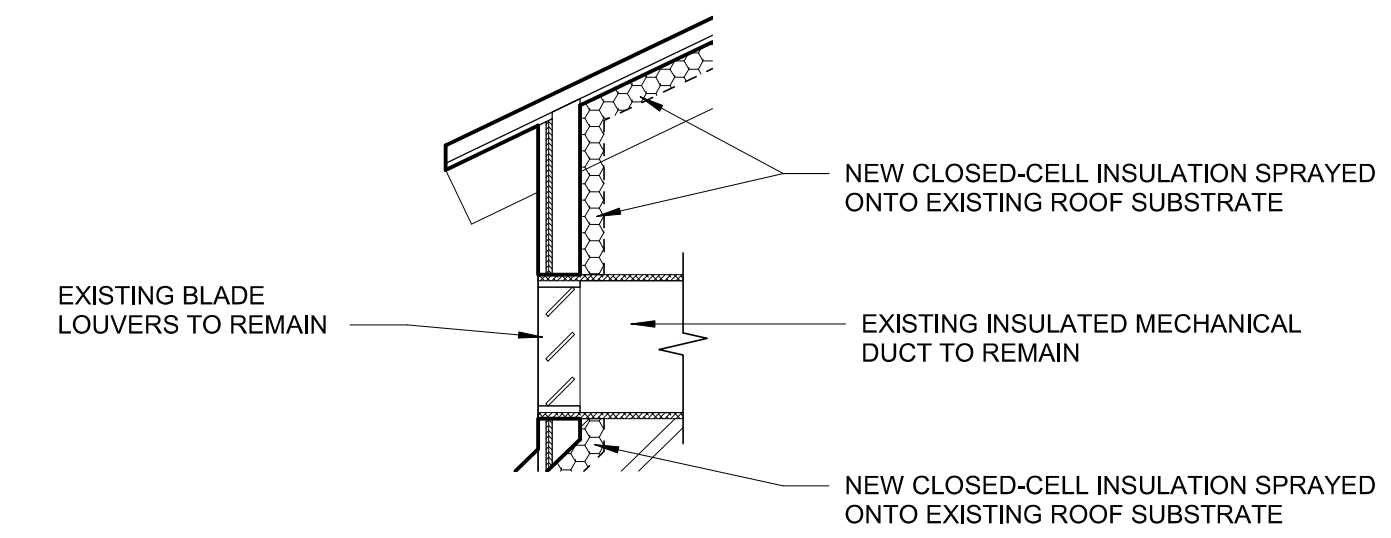
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**A300**



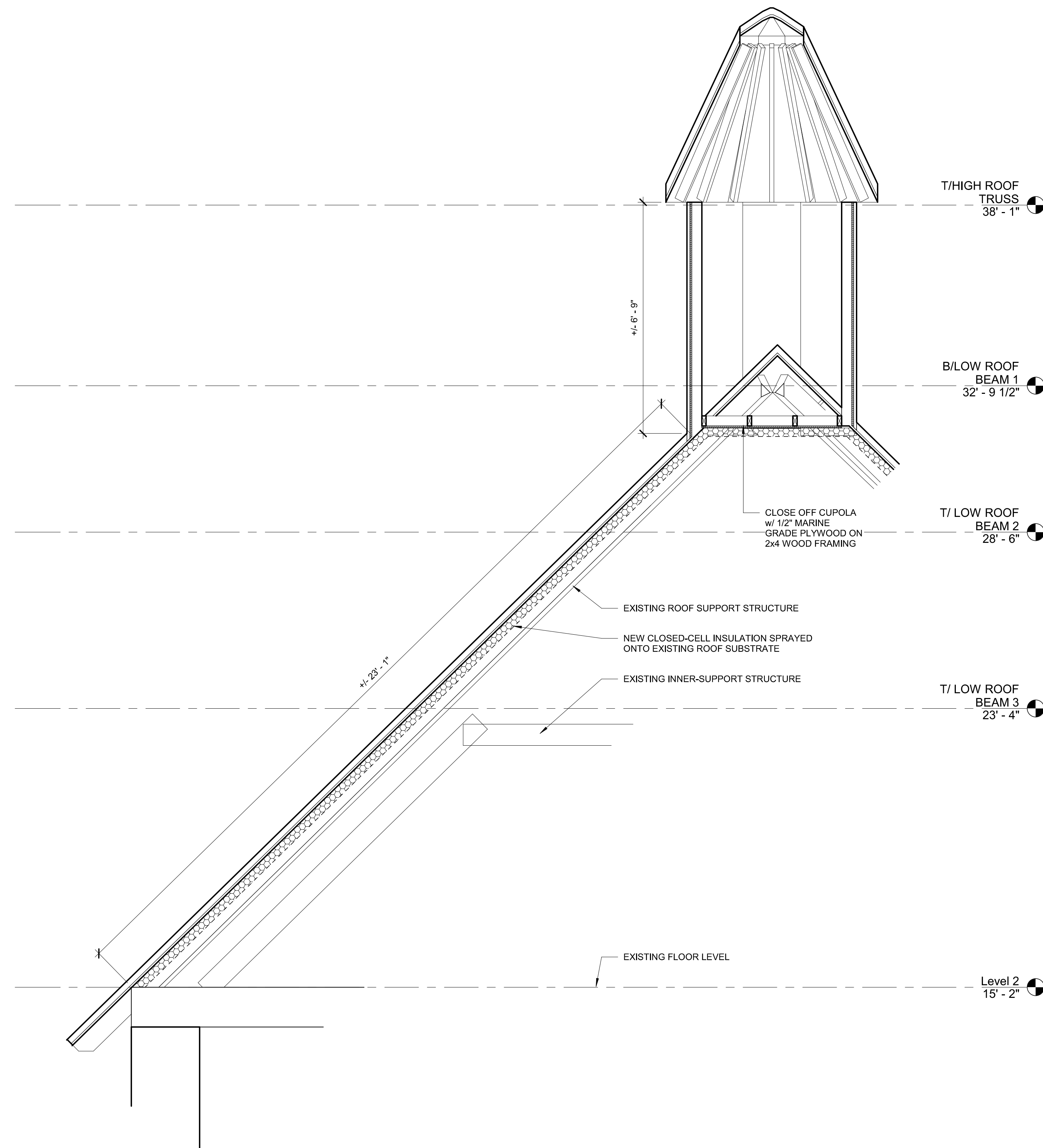
**3 BUILDING SECTION**  
A301 SCALE: 1/4" = 1'-0"**2 BUILDING SECTION**  
A301 SCALE: 1/4" = 1'-0"**1 BUILDING SECTION**  
A301 SCALE: 1/4" = 1'-0"NOTE:  
ALL DIMENSIONS SHALL  
BE FIELD VERIFIED*Emmanuel Kollias*2 ISSUED FOR PERMITS/ BID 09.06.2022  
1 60% REVIEW 07.27.2022**REVISIONS**DATE: Issue Date  
SCALE: 1/4" = 1'-0"



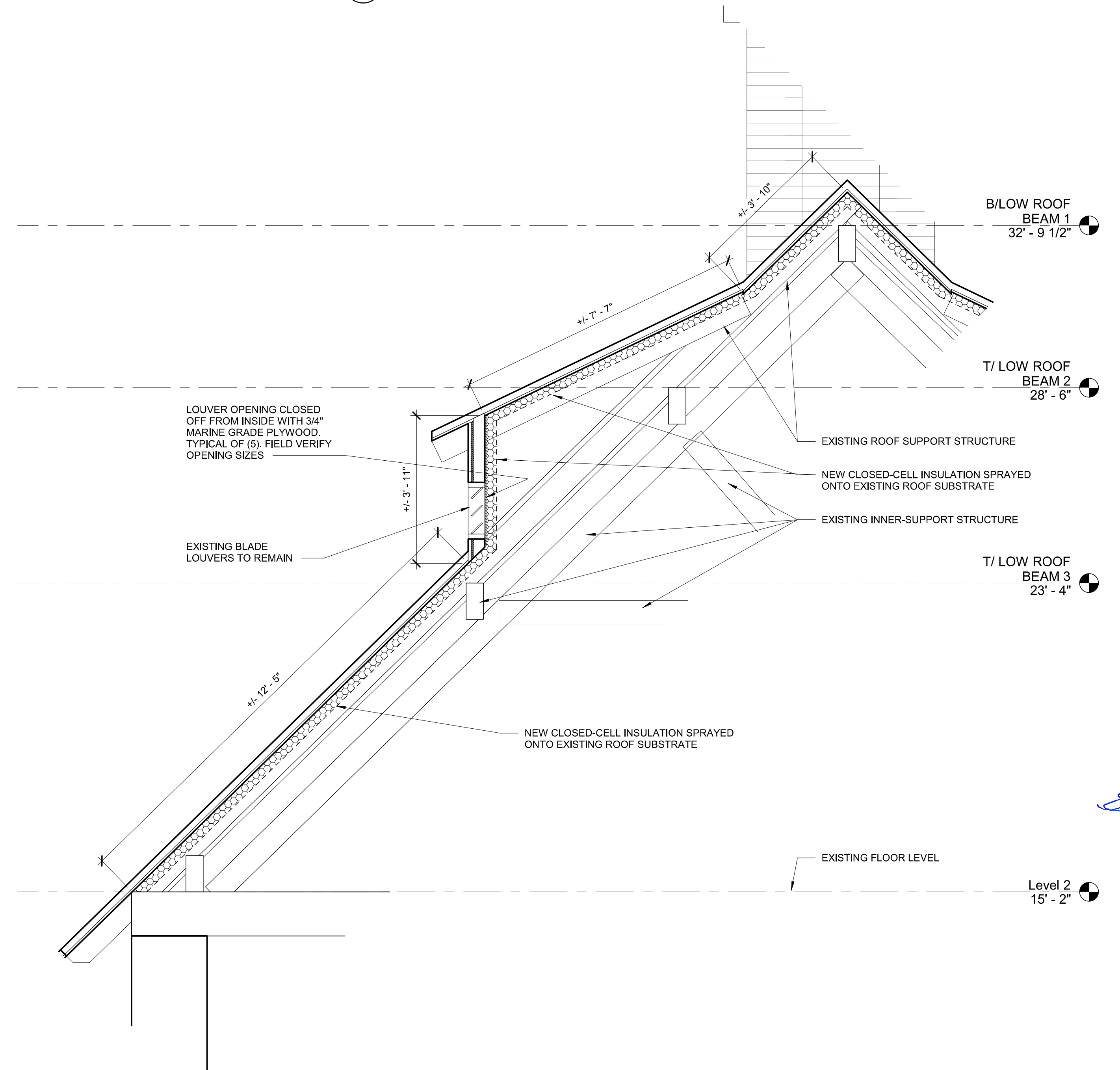
PROJECT NAME:

**KMETRO  
HISTORIC DEPOT**459 N. BURDICK ST.  
KALAMAZOO, MI 49007**CENTRAL  
COUNTY  
TRANSPORTATION  
AUTHORITY**530 NORTH ROSE STREET  
KALAMAZOO, MI 49007NOTE:  
ALL DIMENSIONS SHALL  
BE FIELD VERIFIED**3 ALTERNATIVE DETAIL AT LOUVERS**

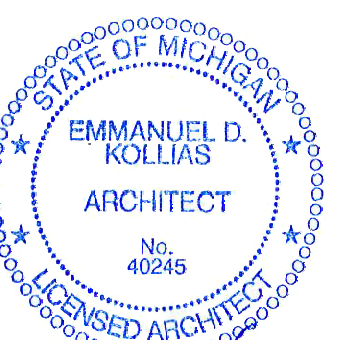
A400 SCALE: 1/2" = 1'-0"

**2 TYPICAL WALL SECTION @ CUPOLA**

A400 SCALE: 1/2" = 1'-0"

**1 TYPICAL WALL SECTION AT DORMER**

A400 SCALE: 1/2" = 1'-0"

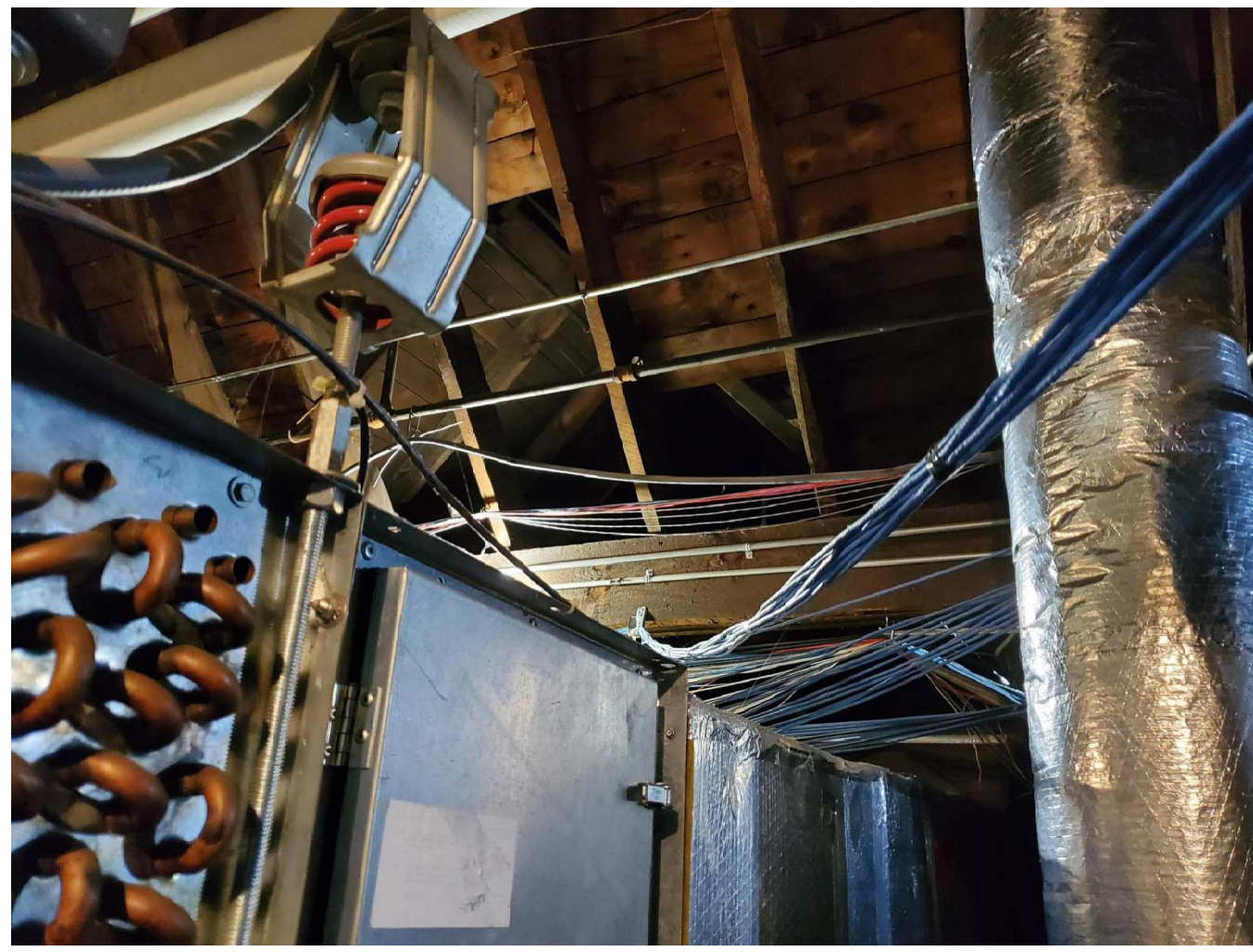
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1 60% REVIEW 07.27.2022**REVISIONS**DATE: Issue Date  
SCALE: 1/2" = 1'-0"

WALL SECTIONS

JOB No. 224096

**A400**





**4 PHOTOGRAPH 04**  
A900 NOT TO SCALE



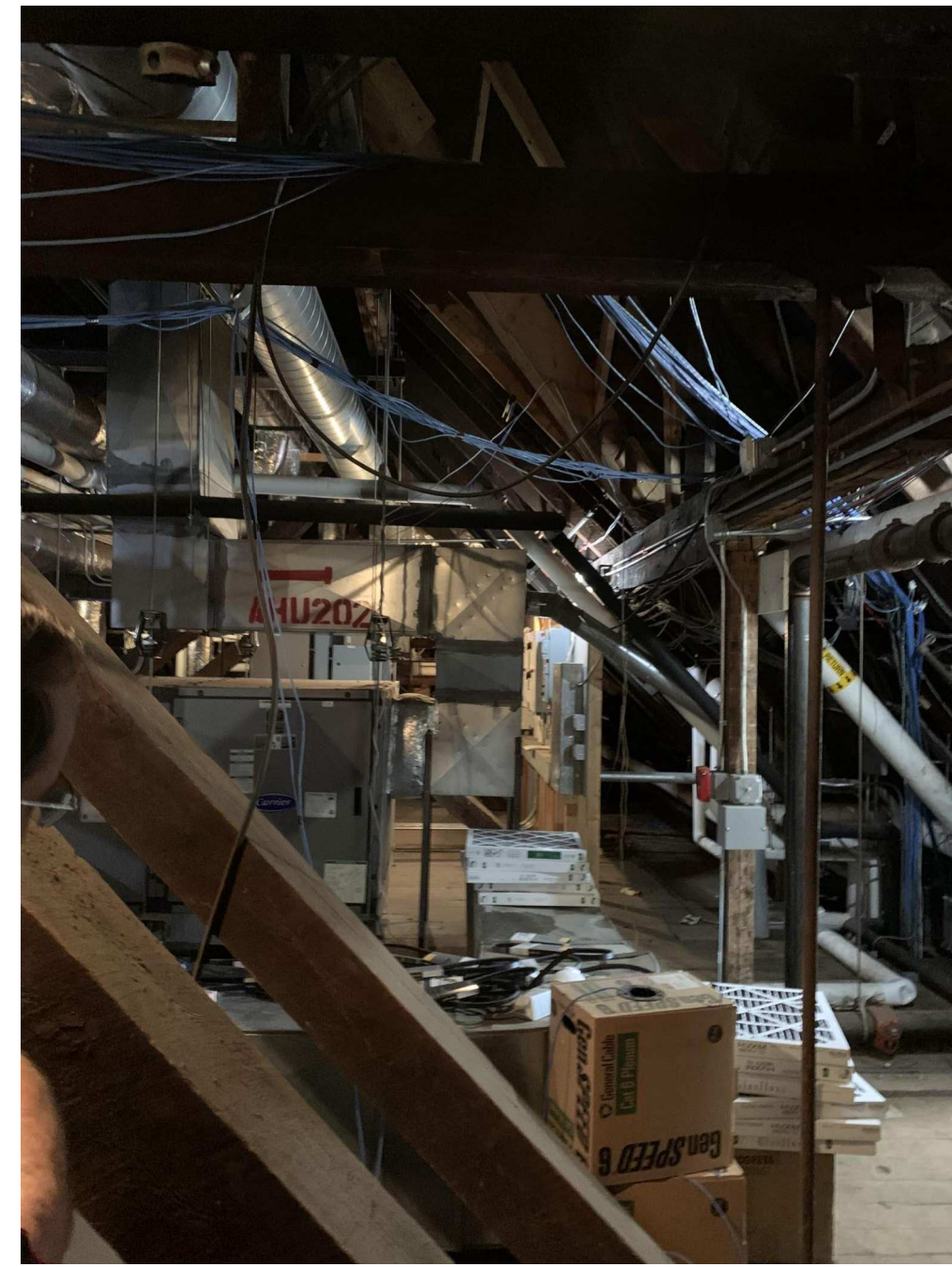
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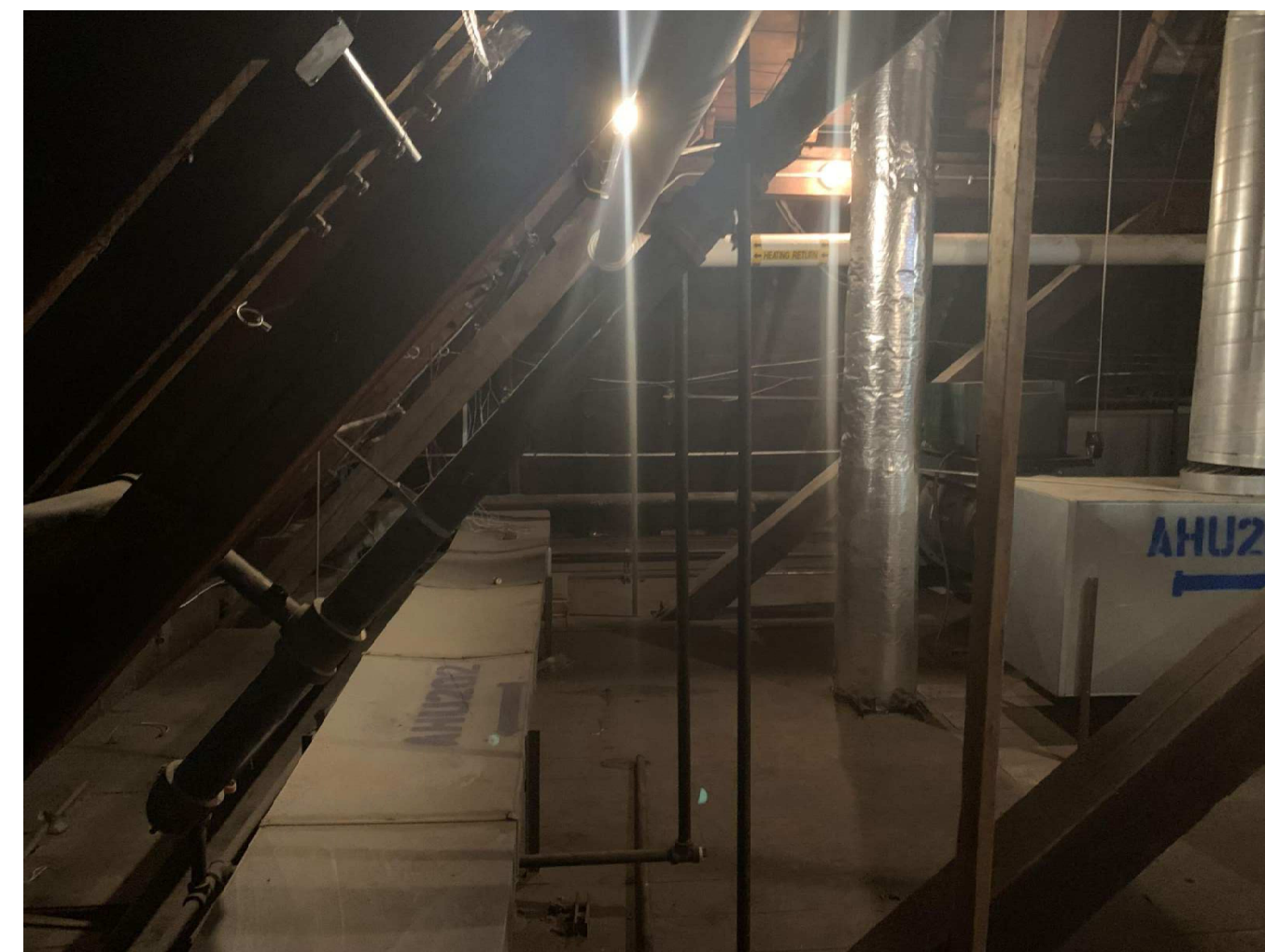
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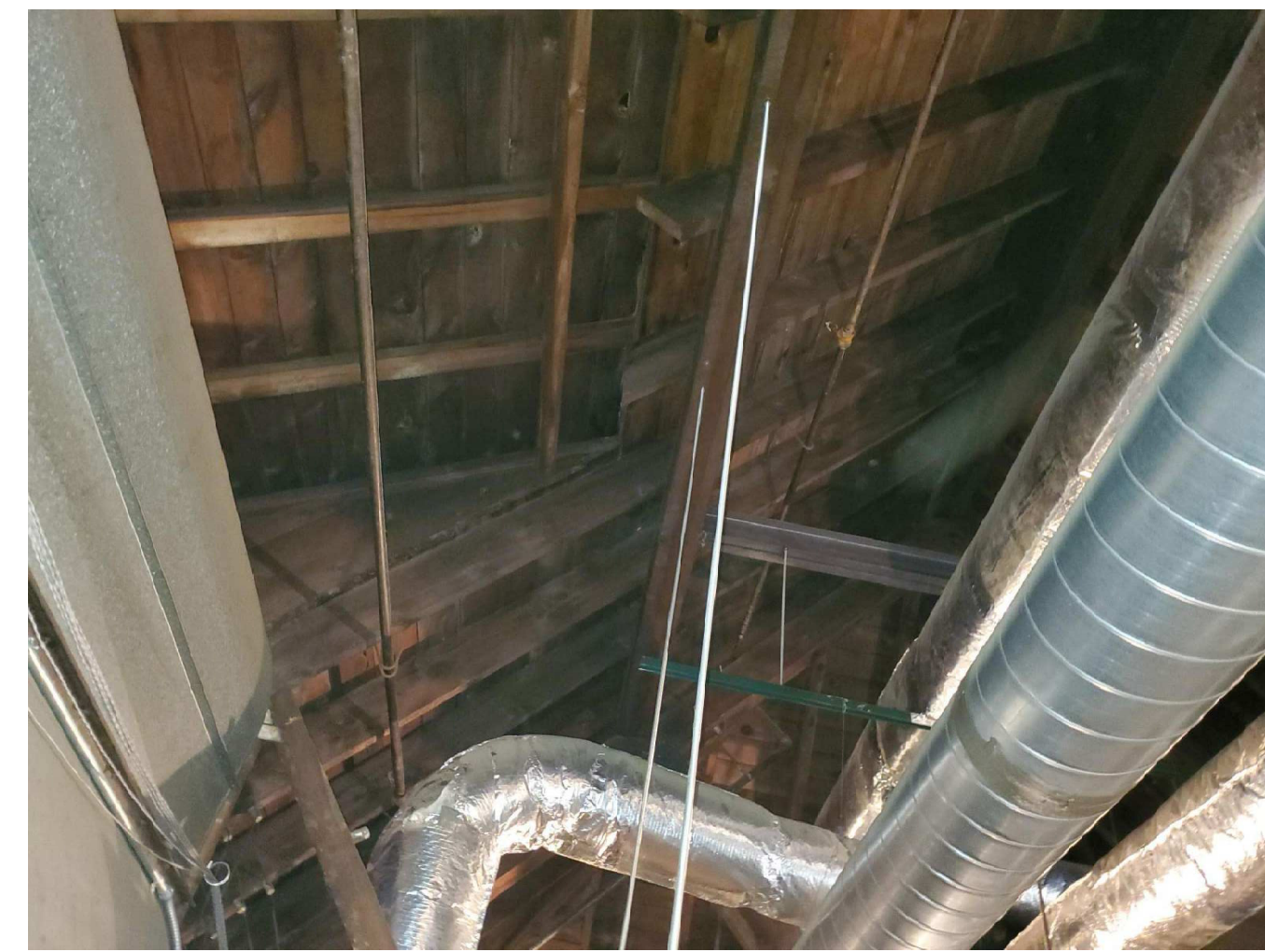
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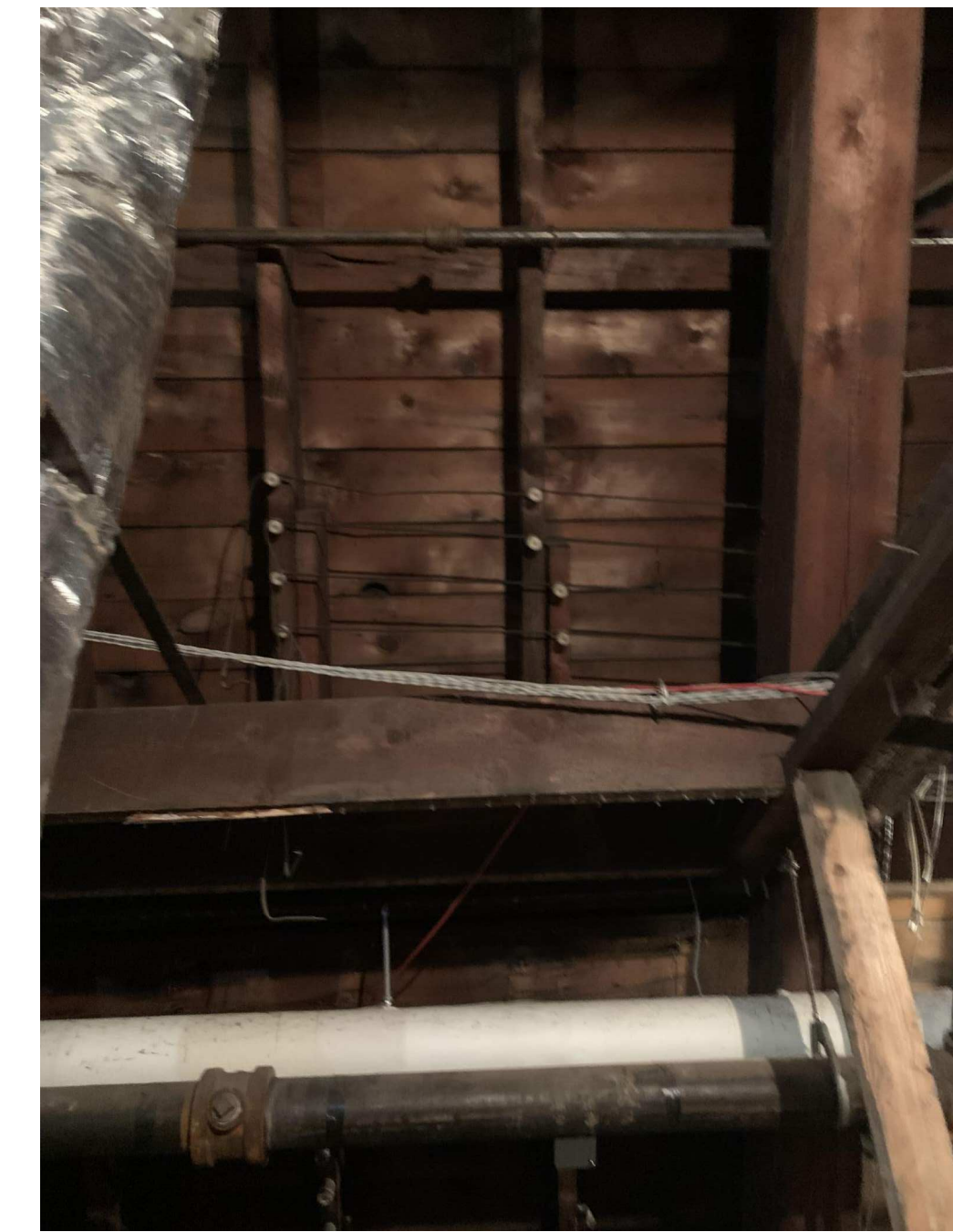
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A900 NOT TO SCALE



**7 PHOTOGRAPH 07**  
A900 NOT TO SCALE



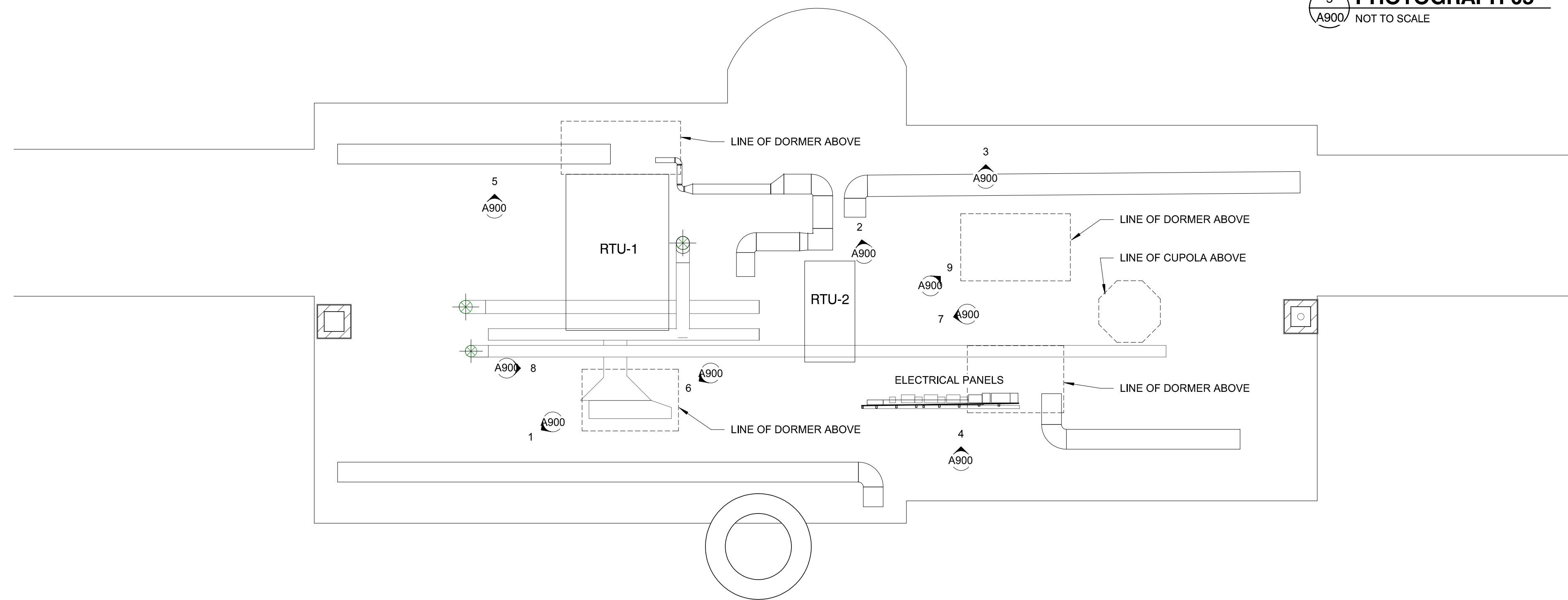
**6 PHOTOGRAPH 06**  
A900 NOT TO SCALE



**5 PHOTOGRAPH 05**  
A900 NOT TO SCALE



**9 PHOTOGRAPH 09**  
A900 NOT TO SCALE



**PHOTOGRAPH PLAN**  
SCALE: 1/8" = 1'-0"





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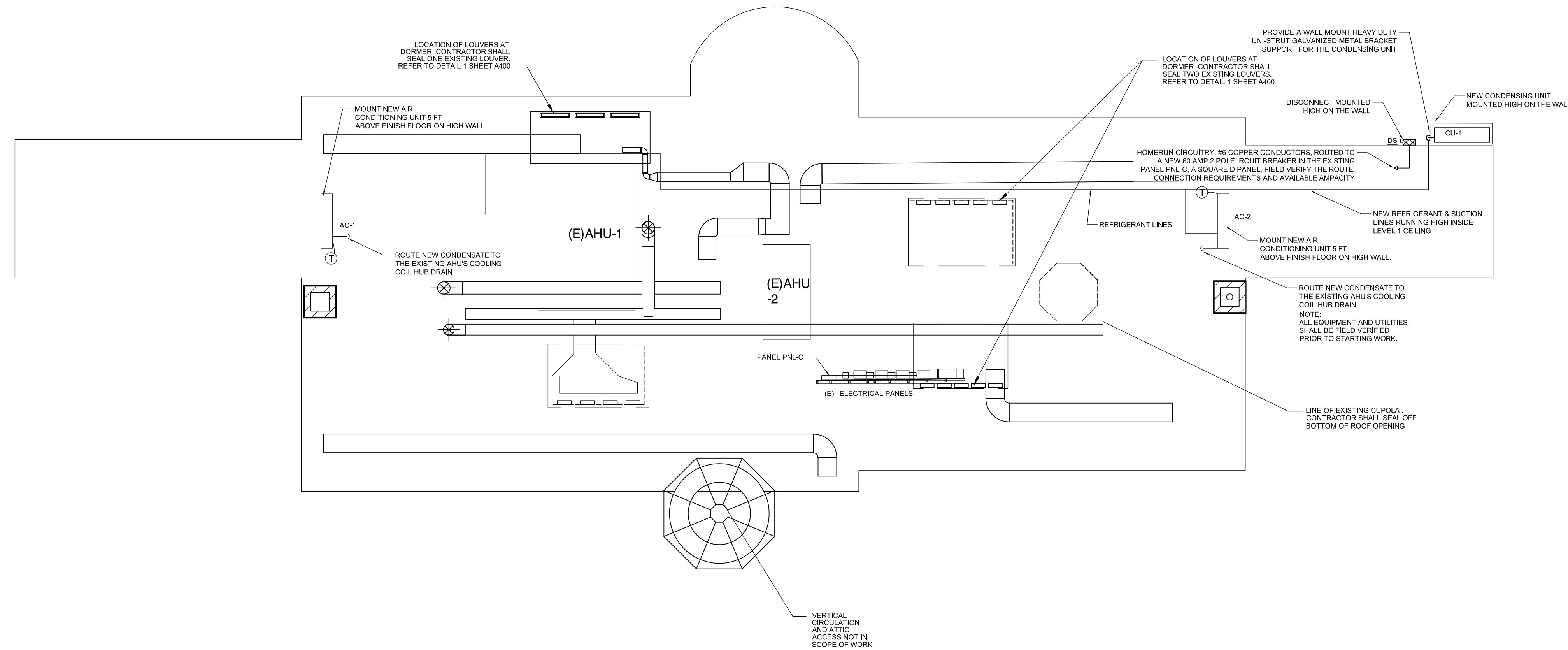
www.gowightman.com



PROJECT NAME:  
**KMETRO  
HISTORIC DEPOT**

459 N. BURDICK ST.  
KALAMAZOO, MI 49007

**CENTRAL  
COUNTY  
TRANSPORTATION  
AUTHORITY**  
530 NORTH ROSE STREET  
KALAMAZOO, MI 49007



**MECHANICAL AND ELECTRICAL FLOOR PLAN**  
SCALE: 1/8" = 1'-0"

**GENERAL HVAC NOTES**

1. CONTRACTOR SHALL LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 4'-0" AFF, A MINIMUM OF 8" FROM LIGHT SWITCH.
2. REFER TO HVAC DRAWINGS FOR THERMOSTAT AND TEMPERATURE SENSOR LOCATIONS.
3. CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.
4. PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.

**ELECTRICAL GENERAL NOTES**

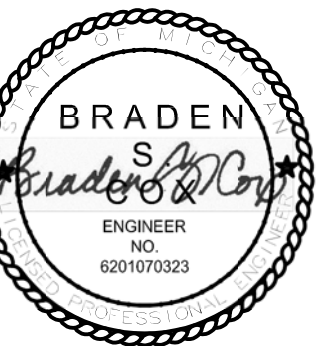
- A. WORK SHALL COMPLY WITH THE N.E.C. AND ALL LOCAL, STATE AND NATIONAL CODES.
- B. COORDINATE WORK WITH THE WORK OF ALL TRADES ON THE PROJECT.
- C. FIELD VERIFY THE EXISTING CONDITIONS PRIOR TO BIDDING.
- D. PROVIDE THE REQUIRED POWER FOR ALL MECHANICAL EQUIPMENT SPECIFIED IN THE CONTRACT DOCUMENTS, EVEN IF NOT SHOWN ON THE POWER PLANS.
- E. THE CONTRACTOR SHALL VERIFY THE POWER REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH THE EQUIPMENT SUPPLIERS, PRIOR TO PREPARING SUBMITTALS OR ORDERING ANY SWITCHGEAR OR EQUIPMENT. SUPPLIED MECHANICAL EQUIPMENT MAY VARY FROM THE EQUIPMENT SPECIFIED IN THE PLANS.
- F. ALL RACEWAYS SHALL BE CONCEALED WHERE POSSIBLE, WHERE CONDITIONS REQUIRE EXPOSED ROUTING, ROUTE CONDUITS IN A NEAT MANNER PARALLEL WITH THE BUILDING LINES AND AS HIGH AS POSSIBLE.
- G. PROVIDE A GROUNDING CONDUCTOR IN RACEWAYS, SIZED PER THE N.E.C.

**GENERAL PROJECT NOTES**

1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING, PRIOR TO FINAL BID, ALL EXISTING CONDITIONS FOR PLUMBING AND MECHANICAL SYSTEMS WITHIN TENANT SPACE AND WITHIN CLOSE PROXIMITY OF TENANT SPACE.
2. THE MECHANICAL CONTRACTOR SHALL PERFORM SERVICE AND REPAIR ON THE EXISTING EQUIPMENT AND ITS ACCESSORIES AS FOLLOWS: CLEAN ALL COILS, REPLACE THE FILTERS AND BELTS, INSPECT, REPAIR, OR REPLACE THE ECONOMIZERS, DRIVES AND FAN BEARINGS, MOTORS, CONTROL COMPONENTS, VALVES AND ANY OTHER ITEM NECESSARY FOR A COMPLETE AND PROPER OPERATING SYSTEM. THIS CONTRACTOR SHALL ALSO VISIT THE SITE, PRIOR TO FINAL BIDDING, AND VERIFY ALL EXISTING SITE CONDITIONS. PROVIDE ALL MATERIAL AND COMPONENTS AS NEEDED TO BRING THE UNITS TO FULL COMPLIANCE OF THE OWNER'S CRITERIA AND LOCAL AUTHORITY HAVING JURISDICTION.
3. COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.
4. THE CONTRACTOR SHALL BE FAMILIAR WITH ALL THE CONDITIONS BOTH EXISTING AND THOSE ILLUSTRATED BY THESE DOCUMENTS AS WELL AS THOSE WHICH CAN BE REASONABLY ANTICIPATED INCLUDING, BUT NOT LIMITED TO ARCHITECTURAL, ELECTRICAL, VENTILATION, PLUMBING, AND OTHER SYSTEMS INVOLVED ON THIS PROJECT.
5. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
6. LOCATE EQUIPMENT REQUIRING ACCESS 2'-0" MAXIMUM ABOVE CEILING.
7. LOCATE DUCTWORK, PIPING AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE ABOVE ELECTRICAL PANELS, TRANSFORMERS AND OTHER ELECTRICAL EQUIPMENT.
8. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE STOPPED. FIRE STOPPING SHALL BE AN APPROVED MATERIAL AS PRESCRIBED IN CSFM STANDARD 43-1 AND SHALL BE U.L. LISTED.
9. PROVIDE SLEEVES AND/OR OPENINGS TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.
10. MAINTAIN CLEAR ACCESS TO SERVICE EQUIPMENT AND OTHER ACCESSORIES REQUIRING SERVICE, VISUAL INSPECTION OR HAND OPERATION. WHERE INDICATED OR REQUIRED, PROVIDE ACCESS PANELS OF THE TYPE SELECTED TO SUIT MATERIALS IN WHICH INSTALLED. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES.
11. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.
12. LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWING, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.
13. INSTALL EXPOSED PIPING AND DUCTWORK AS HIGH AS PRACTICAL IN ROOMS WITHOUT CEILINGS.
14. THE CONTRACTOR'S WORK SCHEDULE SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER.
15. PRIOR TO STARTING WORK, SUBMIT SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT, PLUMBING FIXTURES, AND DIFFUSERS.
16. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND SHALL ARRANGE FOR ALL INSPECTIONS AS REQUIRED.
17. PROVIDE ONE YEAR WARRANTY FOR ALL WORKMANSHIP AND MATERIALS AFTER THE DATE OF FINAL ACCEPTANCE.
18. EACH DETAIL INCLUDED IN THIS SET OF DOCUMENTS APPLIES TO THIS PROJECT REGARDLESS IF EACH DETAIL HAS BEEN REFERENCED ON THE PLANS OR NOT.

**MECHANICAL SHEET LIST**

SHEET	DESCRIPTION
ME101	MECHANICAL AND ELECTRICAL FLOOR PLAN
M500	MECHANICAL DETAILS AND SCHEDULES
M501	SPECIFICATIONS
M502	SPECIFICATIONS
M503	SPECIFICATIONS
M504	SPECIFICATIONS



1 Issued for Bid 09.06.2022

**REVISIONS**

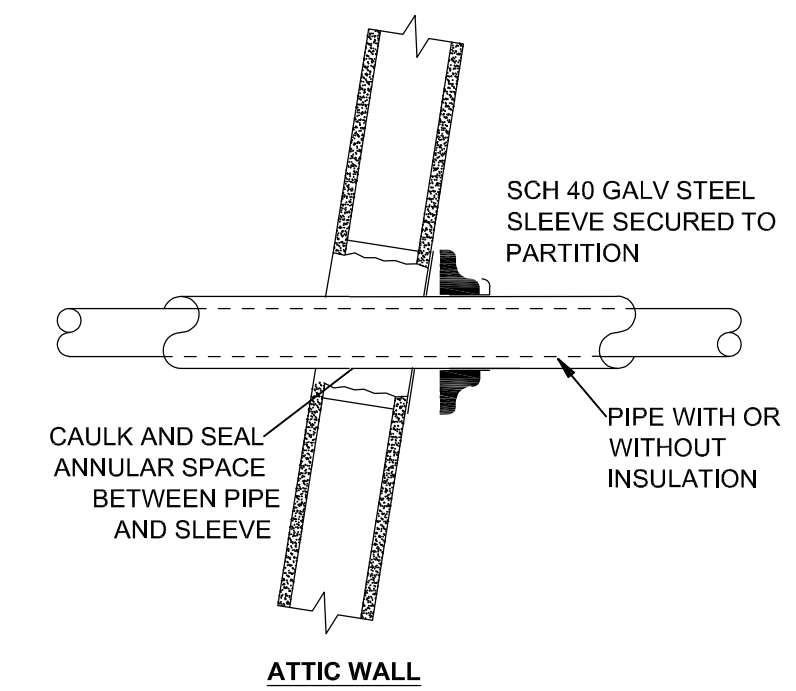
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DATE: Issue Date  
SCALE: 1/8" = 1'-0"

FLOOR PLANS

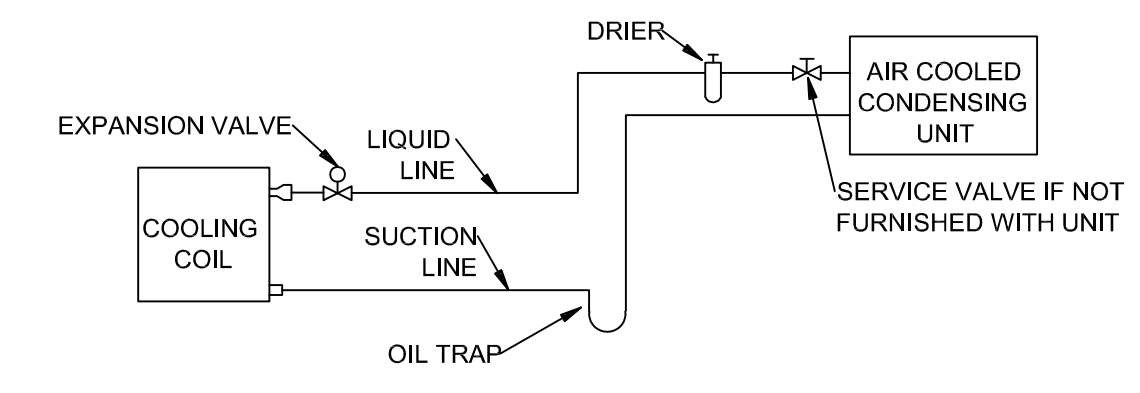
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**ME101**



- ATTIC WALL**
- NOTES:**
1. TYPICAL FOR NON-INSULATED PIPE AND CONDUIT.
  2. ALL CAULKING AND SEALANT SHALL BE FIRE RATED (REFER TO THE SPECIFICATIONS).
  3. WHERE PIPING IS EXPOSED AT FINISHED WALL, FLUSH MOUNT SLEEVE AND PROVIDE AN ESCUTCHEON PLATE.

**4 PIPE PENETRATION THROUGH ATTIC WALL**  
 M500 SCALE: NTS



**3 SPLIT SYSTEM UNIT PIPING SCHEMATIC**  
 M500 SCALE: NTS

DISCONNECT SWITCH SCHEDULE									
MARK	LOAD		SWITCH			FUSE		NEMA	REMARKS
	EQUIPMENT SERVED	VOLTS	DUTY	AMP	POLES	AMP	TYPE		
DS	HVAC SYSTEM	240	GENERAL	60	2	-	-	3R	-

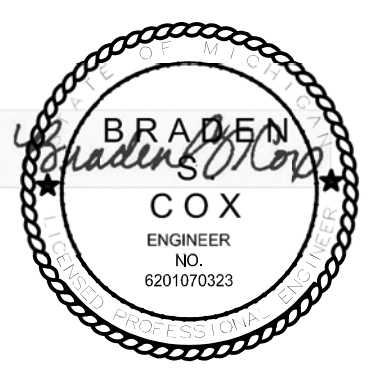
DUCTLESS SPLIT SYSTEM INDOOR UNIT SCHEDULE															
MARK	DESCRIPTION	MANUFACTURER	MODEL	AIR FLOW CFM (H/M/L)	COOLING			HEATING		WEIGHT LBS.	ELECTRICAL			ACCESSORIES	REMARKS
					OUTSIDE AIR FLOW CFM	SENSIBLE CAPACITY MBH	TOTAL CAPACITY MBH	OA TEMP.	OUTPUT MBH		V/PH	MCA	MOCF		
AC-1	HIGH WALL HEAT PUMP	CARRIER	40MAHBQ-24XA3	600/400/300	0	19.4	23.5	95	22	100	208/1	-	-	TS	1, 2, 3
AC-2	HIGH WALL HEAT PUMP	CARRIER	40MAHBQ-24XA3	600/400/300	0	19.4	23.5	95	22	100	208/1	-	-	TS	1, 2, 3

- ACCESSORIES:**
- TS - NON-PROGRAMMABLE THERMOSTAT MOUNTED AT 3'-0" ABOVE THE ATTIC FLOOR.

- REMARKS:**
1. MCA AND MOCF FOR INDOOR UNIT ARE POWERED BY THE OUTDOOR UNIT.
  2. REFRIGERANT LINE SET SIZED BY THE CONTRACTOR.
  3. REFER TO THE MANUFACTURER'S INFORMATION FOR ADDITIONAL ACCESSORIES AND TECHNICAL DATA.

DUCTLESS SPLIT SYSTEM OUTDOOR UNIT SCHEDULE																	
MARK	MANUFACTURER	MODEL	SYSTEM TYPE	INDOOR UNITS	REFRIG.	COOLING			HEATING		WEIGHT LBS.	ELECTRICAL		ACCESSORIES	REMARKS		
						TOTAL CAPACITY MBH	OUTSIDE AIR TEMP °F	SEER RATING	OUTPUT MBH	HSPF		OUTSIDE AIR TEMP °F	V/PH			MCA	MOCF
CU-1	CARRIER	38MGHBQ48EA3	HEAT PUMP	HIGH WALL	R-410A	48	92	21.5/11.6	45	-	0	300	208/1	40	60	-	1

- REMARKS:**
1. FIELD FABRICATED GALVANIZED WALL BRACKET.



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DETAILS AND SCHEDULES