Secondary Roads Department
19501 HWY 64, P.O. Box 368
Anamosa, IA 52205
Telephone: (319) 462-3785
Email: engineer@jonescountyiowa.gov

PROJECT MANUAL

SECTION 00 01 01
PROJECT TITLE PAGE

ANAMOSA STORAGE BUILDING RECONSTRUCTION & ADDITION

PROJECT NUMBER: **M-0427**

OWNER **JONES COUNTY**
LOCATION SECONDARY ROAD DEPARTMENT
19501 ST HWY 64
ANAMOSA, IA 52205

ISSUE DATE **JUNE 2026**

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ADVERTISEMENT FOR BIDS

1.01 PROJECT INFORMATION

A. Notice to Bidders: Qualified bidders may submit bids for project as described in this Document. Submit bids according to the Instructions to Bidders.

B. Project Identification: Anamosa Storage Building Addition

1. Project Location:
   19501 Highway 64
   Anamosa, IA 52205

C. Owner: Jones County Secondary Road Department

D. Project Description: Project consists of a new building for use by the Jones County Secondary Road Department for the storage of Secondary Road equipment and vehicles which shall be attached to an existing storage building. In addition to the new building, the existing storage building shall be stripped of its existing metal roof and wall panels. New insulated metal roof and wall panels shall be installed along with new sectional doors added.

1.02 BID SUBMITTAL AND OPENING

A. Bids shall be submitted to the Jones County Auditor's Office at 500 West Main Street, Anamosa, Iowa, 52205 before 10:00 AM on July 21, 2026. Bids must be completed and submitted by this time, or your bid will not be accepted.

B. Bids will be thereafter publicly opened and read aloud.

1. Bid Date: July 21, 2026.
2. Bid Time: 10:00 AM, local time.
3. Location: Jones County Courthouse, 500 West Main Street, Anamosa, Iowa, 52205 in the Boardroom.

C. Bids shall be considered by the Owner at a public hearing to be held:

1. Public Hearing Date: July 21, 2026.
2. Public Hearing Time: 9:30 AM, local time.
3. Location: Jones County Courthouse, 500 West Main Street, Anamosa, Iowa, 52205 in the Boardroom.

1.03 BID SECURITY

A. Bid Security shall be submitted with each bid as security. The successful bidder will enter into a contract for the work bid and shall furnish after the award of contract corporate surety bond or bonds, acceptable to the Owner, for the faithful performance of the contract in the amount equivalent to 100% of the amount of the contract.

1. Bid security shall be in the amount of 1% of the bid amount.
2. Bid security shall be in the form of a cashier's check or certified check drawn on a bank in Iowa or a bank chartered under the laws of the United State of America, or a certified bank share draft drawn on a credit union in Iowa or chartered under the laws of the United States of America or a bid bond with corporate surety satisfactory to the Owner.
3. The bid security will be held by the Owner until a contract is fully executed and bonds are approved by the Owner.
4. No bids may be withdrawn for a period of 60 days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.04 DOCUMENTS

A. Bidding documents may be examined online or at the following location(s):

1. Jones County Engineer's Office, 19501 Highway 64, Anamosa, Iowa, 52205
2. www.jonescountyiowa.gov/secondary_roads

1.05 TIME OF COMPLETION

A. Successful bidder shall begin the Work on receipt of the Notice to Proceed and shall complete the work within the Contract Time.
   1. Work Substantially Complete on or before: August 31, 2027.

1.06 BIDDER'S QUALIFICATIONS

A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work.

1.07 TAXES

A. Contractors using 'materials, supplies, and equipment' on projects in designated 'exempt entities' may purchase these items without liability for the sales tax. The contractor must have a purchasing agent authorization letter and an exemption certificate from the public entity to present to the retailer, which specifies the construction project and will be available for that project only.

B. Owner will issue an authorization letter and an exemption certificate to the contractor and/or subcontractors for the purchase or use of building materials, supplies, and equipment to be used on the project only. Do not include sales tax on your bid form.

1.08 GENERAL INFORMATION

A. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, and to Iowa labor to the extent lawfully required under Iowa law.

B. It is the intent of the Owner to award a contract to the lowest responsible, responsive bidder provided the bid has been submitted in accordance with the bidding requirements. The Owner reserves the right to waive informalities or irregularities. The Owner reserves the right to reject any or all bids.

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.01 SUMMARY

A. These Instructions to Bidders govern preparation and submission of bids for a single-prime contract for the construction of a new steel storage building and rehabilitation of an existing steel storage building, together with all related site work, building modifications, structural repairs, roofing and siding replacements, door and opening work, interior improvements, electrical work, and other work indicated in the Contract Documents. Bidders shall base bids on complete performance of the Work described in the Drawings, Specifications, addenda, and all other bidding requirements.

1.02 PROCUREMENT METHOD

A. The work will be awarded under a competitive public bidding process. The Owner reserves the right to reject any or all bids, waive informalities, request clarification, and accept the bid that is determined to be responsive and responsible and in the Owner's best interest, subject to applicable law.

1.03 BIDDER'S REPRESENTATIONS

A. By submitting a Bid, the Bidder represents that:
   1. Bidder has read and understands the Bidding Documents;
   2. Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
   3. Bid complies with the Bidding Documents
   4. Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
   5. Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exceptions; and
   6. Bidder has read and understands the provisions for liquidated damages.

B. The Bidder has investigated all the required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted Bid, the cost of such fees, permits and requirements not otherwise indicated as provided by Owner.

PART 2 BIDDING DOCUMENTS

2.01 DISTRIBUTION

A. Bidders shall obtain complete Bidding Documents from the issuing office designated in the Advertisement for Bids.

B. Bidders shall use complete Bidding Documents in preparing Bids. The Owner assumes no responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

C. The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

2.02 MODIFICATION OR INTERPRETATION OF BIDDING DOCUMENTS

A. This Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Owner of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation.

B. Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Owner at least seven days prior to the date for receipt of Bids.
   1. Submit via email to engineer@jonescountyiowa.gov

C. Modifications and interpretations of the Bidding Documents shall be made by Addendum.
D. Addenda will be issued in order to be received by all plan holders of record not less than 48 hours prior to the date and time that bids are due, except an addendum which includes postponement of the date for receipt of bids.

2.03 SUBSTITUTIONS

A. The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.
B. The burden of proof of the merit of the proposed substitution is upon the proposer. The Owner's decision of approval or disapproval of a proposed substitution shall be final.

2.04 BIDDING PROCEDURES

A. Bids shall be submitted on the forms included with or identified in the Bidding Documents.
B. All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.
C. Edits to entries made on paper bid forms must be initialed by the signer of the Bid.
D. A Bidder shall incur all costs associated with the preparation of its Bid.

2.05 SUBMISSION OF BIDS

A. A Bidder shall submit its Bid as indicated on the Advertisement for Bids.
B. Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope.
C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

2.06 MODIFICATION OR WITHDRAWAL OF BID

A. Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw it Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids.
B. Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established herein, provided they fully conform with these Instructions to Bidders.

PART 3 CONSIDERATION OF BIDS

3.01 RESPONSIVENESS AND RESPONSIBILITY

A. The owner will review bids for responsiveness to the Bidding Documents and may evaluate responsibility based on qualifications, experience, financial capability, bid security, compliance with statutory requirements, references, and ability to complete the Work within the required time.

3.02 OPENING OF BIDS

A. If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud.
B. A summary of the Bids may be made available to Bidders.

3.03 REJECTION OF BIDS

A. Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

3.04 ACCEPTANCE OF BID (AWARD)

A. It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents.
B. The Owner reserves the right to investigate bid irregularities and request additional information needed to determine responsibility.

3.05 POST-BID INFORMATION

A. Apparent low Bidder shall promptly furnish additional documentation requested by the Owner, including contractor qualification information, list of subcontractors, proposed schedule, evidence of bonding capacity, and other forms required for award.

B. After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner:

1. Designation of the Work to be performed with the Bidder's own forces;
2. Names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
3. Names of persons or entities proposed for the principal portions of the Work.

PART 4 PERFORMANCE BOND

4.01 BOND REQUIREMENTS

A. A Performance Bond is required. Cost of the Bond shall be included in the Bid.

B. Bidder shall furnish bonds covering the faithful performance of the Contract and all obligations arising thereunder.

C. The bond shall remain in effect through completion of the Work and correction of defective work as required by the Contract Documents.

4.02 EXECUTION

A. The party to whom the Contract is awarded will be required to execute the Contract and furnish a Performance Bond(s) within thirty calendar days from the date when the written "Notice of Award" of the Contract is mailed to the Bidder at the address given. In case of failure by the Bidder, Jones County may, at their option, consider that the Bidder has abandoned the Contract.

B. The bonds shall be dated on or after the date of the Contract.

PART 5 CONTRACT TIME

5.01 CONSTRUCTION SCHEDULE

A. Within thirty days after date of received Notice of Award, contractor shall submit preliminary schedule defining planned operations for the first sixty days of work, with a general outline for remainder of work.

B. It is the intent of the Owner to have construction substantially complete by August 31, 2027. It will be the General Contractor's option to decide the construction start date.

5.02 LIQUIDATED DAMAGES

A. Liquidated damages will commence September 1, 2027 in the amount of $500 per day.

PART 6 PAYMENT PROCEDURES

6.01 GENERAL

A. The contractor shall furnish and pay the cost of all the necessary materials and shall furnish and pay for all the labor, equipment, and transportation and perform all the work required for the construction of all items in strict accordance with the Plans, Specifications, and Contract Documents and such supplemental plans and specifications which may hereafter be approved.

6.02 APPLICATIONS FOR PAYMENT

A. Owner shall make partial payments at monthly intervals.

B. Partial payments are not to exceed ninety-seven percent (97%) of the contract value of the work during the preceding calendar month.

C. The value of work during the preceding calendar month shall be as estimated by the Contractor and approved by the Owner. Prior to receiving any partial payment, the Contractor must furnish the Owner with a statement showing the total amount owed to date for materials and labor procured under this contract and, if required by the Owner, must also submit evidence showing that previous partial payments were properly applied and that the current payment will be properly applied.

D. Upon completion of the whole contract and acceptance of the work as required hereunder, by the Owner, and compliance by the Contractor with all terms and conditions of this contract, amount due the Contractor will be paid.

E. Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the Owner from loss on any of the following:
   1. Defective work not remedied;
   2. Claims filed;
   3. Failure of Contractor to make payments properly to Sub-Contractors or suppliers;
   4. Reasonable doubt that the work can be completed for the balance then unpaid;
   5. Damage to another Contractor; and
   6. Performance of work in violation of the terms of the Contract Documents.

PART 7 MONDIFICATION PROCEDURES

7.01 GENERAL

A. Owner will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

7.02 WORK CHANGE PROPOSALS

A. All changes affecting the project's construction cost or modifications of the terms or conditions of the contract must be authorized by means of a written contract change order which is mutually agreed to by Owner and the Contractor.

B. The contract change order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements.

C. All changes must be recorded on a contract change order document before they may commence or included in a partial payment estimate.

PART 8 PROJECT MANAGEMENT AND COORDINATION

8.01 OWNER OCCUPANCY

A. Jones County Roads maintenance personnel intend to occupy the existing storage building facility to the full extent practicable.

B. Work will only be permitted on either the new storage facility construction or the existing storage facility, unless given written permission from the Owner. Work on both buildings simultaneously will not be allowed.

C. Coordinate with Owner to minimize conflict and to facilitate Owner's operations.

8.02 CONTRACTOR USE OF SITE AND PREMISES

A. Conduct progress meetings at regular intervals, as determined by the Owner.

B. Construction operations shall be limited to areas noted on drawings.

C. Locate and conduct construction activities in ways that will limit disturbance to site.

D. Arrange use of site and premises to allow for work by others and work by Owner.

E. Upon completion or termination of the work, the contractor shall remove from the vicinity of the work all equipment and all temporary structures, waste materials, and rubbish resulting from its operations, leaving the premises in a neat and presentable condition.

END OF SECTION

SECTION 00 41 13
BID FORM

PROJECT: Anamosa Storage Building Addition
BID TO: Jones County
500 West Main Street, Anamosa, Iowa 52205

SUBMIT BID TO: Jones County Auditor
500 West Main Street, Anamosa, Iowa

BID OPENING: Jones County Courthouse Boardroom
500 West Main Street, Anamosa, Iowa

SUBMITTED BY: _____
(BIDDER TO ENTER NAME AND ADDRESS)

Bidder's Full Name: _____

Address: _____

City, State, Zip: _____

NOTE: All blanks shall be completed. Only bids on this form will be accepted.

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all work as specified or indicated in the Contract Documents for the Bid Price and within the schedule indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER is encouraged to visit the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work.
3. BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, performance, and furnishing of the Work.
4. BIDDER will complete the Work in accordance with the Contract Documents for the following bid price(s) per Section 004201 Schedule of Bid Prices.

BIDDER INFORMATION

Company Name: _____

Business Address: _____

Phone No.: _____ Email: _____

By: _____ _____
(signature of person authorized to sign) (printed name and title)

END OF SECTION

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SECTION 00 42 01
SCHEDULE OF BID PRICES

THIS DOCUMENT SHALL BE USED AS THE FORM FOR SUBMITTING PROJECT BID PRICES

Bidder's Full Name: _____

Address: _____

Anamosa Storage Building Addition:

Project Description: Project consists of a new 180' x 60' steel storage building for use by the Jones County Secondary Road Department for the storage of Secondary Road equipment and vehicles. New building shall be attached to an existing 156' x 50' steel storage building. In addition to the new building, the existing storage building shall be stripped of its existing metal roof and wall panels. New insulated metal roof and wall panels shall be installed along with new sectional doors added.

TOTAL PRICE: $ _____

_____
(amount written in words here)

By: _____ _____
(signature of person authorized to sign) (printed name)

_____
(title)

END OF SECTION

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SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the selective demolition and disposal of the end bay of the existing steel storage building, the removal of existing exterior steel roof and exterior wall panels, and incidental work required to leave the remaining structure stable and ready for subsequent work.

1.02 SUBMITTALS

A. Submit demolition work plan identifying sequence of operations, means of access, debris handling procedures, and protection of structural members to remain.

1.03 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

PART 2 PRODUCTS - Not applicable to this Section

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the existing building and confirm layout of roof and wall panels, lapped joints, trim conditions, framing support spacing, and locations of attachments to remain.

B. Identify unsafe or deteriorated conditions that could affect removal procedures. Before removal begins, disconnect or protect accessories attached to panels, including gutters, downspouts, flashings, vents, closures, sealants, and appurtenances within the limits of work.

3.02 DEMOLITION SEQUENCING

A. Perform demolition in a controlled sequence that prevents damage to the portion of the building that remains.

B. Remove nonstructural components first, including doors, frames, accessories, trims, wall panels, roof panels, insulation, and other removable elements within the end bay limits.

C. Install temporary shoring and bracing before cutting or removing structural members that provide lateral or vertical support to the remaining building.

D. Sawcut or otherwise neatly separate slabs, foundations, and embedded items to remain from those designated for removal.

3.03 STRUCTURAL STABILITY AND CUTTING

A. Perform cutting and removal using methods that minimize distortion of steel members and damage to coatings or components that remain.

B. Do not cut through members or connections designated to remain except as specifically indicated or approved.

C. Provide temporary and permanent bracing required to replace stability lost before removal of the end bay.

D. Promptly install permanent closure framing, end-wall bracing, and connection reinforcement needed to restore the design load path of the remaining structure.

3.04 SALVAGE, DISPOSAL, AND CLEANING

A. Salvage items specifically designated for Owner retention. Protect salvaged items from damage and store or deliver as directed.

B. Remove demolition debris from the site on a continuing basis. Do not allow debris to accumulate.

C. Leave the site and remaining structure broom clean and free of hazardous conditions at completion of work.

3.05 REPAIRS

A. Repair damage caused by demolition operations to construction that remains.

B. If demolition exposes concealed deficiencies in the remaining structure, notify the Owner or Engineer before proceeding with corrective work.

3.06 SCHEDULE

A. Items to be Salvaged for Delivery to Owner:
   1. [Lighting Fixtures.]

B. Utilities Requiring Interruption, Capping, or Removal:
   1. Electric.
   2. Natural Gas.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies cast-in-place concrete, formwork, concrete reinforcement, floors and slabs on grade, concrete materials, mixture design, placement procedures, finishes and joints for the following:
   1. Footing
   2. Foundation Wall
   3. Slabs-on-Grade

1.02 SUBMITTALS

A. Submit field or laboratory test records used to document that proposed mixture will achieve the required average compressive strength and other specified requirements.
B. Submit proposed concrete mix design.
C. Product Data for Sealants: Submit manufacturer's technical data sheets for product to be used.

1.03 PRE-CONCRETE CONFERENCE

A. Conduct a meeting to review proposed methods of concrete construction to achieve the required results.

PART 2 PRODUCTS

2.01 FORMWORK

A. Form Materials: Contractor's choice of standard products that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize the number of joints.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60, unless otherwise indicated.
   1. Type: Deformed billet-steel bars.
   2. Finish: Epoxy coated in accordance with ASTM A775/A775M, unless otherwise indicated.
B. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.

2.03 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
B. Normal Weight Concrete:
   1. Compressive Strength, as indicated in the structural drawings, 4000 psi minimum for footings and foundation walls. 3500 psi minimum for slabs-on-grade.
   2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
   3. No calcium chloride admixtures will be allowed.

2.04 ACCESSORY MATERIALS

A. Trench Drains: Frames and grates/lids shall be furnished standard in gray iron, meeting ASTM-A48 Class 35-b for heavy-duty use.
   1. Neenah Foundry Co. R-4990 Type A or similar.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
B. Verify that forms are clean and free of rust before applying release agent.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.

B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

C. Inserts, sleeves, trench drains, and similar items shall be properly located and built into construction, and maintained securely in position while concrete is placed.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Finish floors level and flat, unless otherwise indicated.

3.05 SLAB JOINTING

A. Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

C. Control (contraction) Joints: Form weakened-plane control joints, sectioning concrete into areas as indicated.

1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
2. Saw-cut joints to be installed within 12 hours after concrete has been placed.

D. Isolation Joints in Slabs-on-Grade: Prior to placement of concrete, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, and other locations.

3.06 CONCRETE FINISHING

A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1. Other Surfaces to be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

B. Slope finished slab to floor drains as indicated on drawings.

3.07 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
2. Final Curing: Begin after initial curing but before surface is dry.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: Repair and patch defective areas when directed by engineer.

3.09 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 07 21 13
BOARD INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies board insulation at the exterior foundation perimeter of a steel building with cast-in-place concrete foundation and slab-on-grade construction.

1.02 SUBMITTALS

A. Submit manufacturer's technical literature for insulation, adhesive, fasteners, sealants, and accessory materials.

1.03 PROJECT CONDITIONS

A. Do not install insulation over frozen, wet, or irregular substrates. Do not backfill against insulation until attachment is secure, protective coverings are in place where specified, and sealant work has been completed and cured as required.

PART 2 PRODUCTS

2.01 BOARD INSULATION

A. Insulation Type: Extruded polystyrene board insulation, Type IV minimum, unfaced, square edge or ship-lapped edge as recommended by manufacturer for below-grade use.

B. Thermal Performance: Provide nominal thickness and aged thermal resistance as indicated on Drawings to satisfy project code requirements. Unless noted otherwise, minimum board thickness shall be 2 inches.

C. Below-grade insulation shall be moisture resistant, resistant to decay, and suitable for contact with concrete, soil, and dampproofing or waterproofing materials used in the assembly.

2.02 ACCESSORY MATERIALS

A. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine and verify substrate suitability for product installation

B. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. General: Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Slab-on-Grade Insulation: On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

1. If not otherwise indicated, extend insulation a minimum of 48 inches in from exterior walls.

C. Foundation Wall Insulation: Butt panels together for tight fit and install on concrete substrates by adhesively attached, spindle-type insulation anchors.

3.03 PROTECTION AND BACKFILL

A. Protect installed insulation from sunlight, impact, puncture, and displacement during construction.

B. Place backfill in lifts and compact in a manner that avoids breaking, bowing, or dislodging insulation boards. Replace damaged insulation before concealment.

END OF SECTION

SECTION 07 41 16
INSULATED METAL ROOF PANELS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies insulated standing-seam metal roof panels and related trim, closures, sealants, fasteners, and accessories for retrofit application on an existing steel frame storage building and attachment to the existing structural support system.

1.02 PERFORMANCE REQUIREMENTS

A. Roof panel system shall be engineered for project-specific dead, live, wind, snow, and thermal movement loads applicable to the site and building geometry.

1.03 SUBMITTALS

A. Submit manufacturer's technical literature for roof panels, clips, fasteners, insulation core, trim, sealants, closures, and accessories.

B. Submit layout drawings showing panel lengths, seam orientation, support spacing, trim profiles, penetrations, and attachment to the existing steel framing.

C. Samples:

1. Submit color chips showing manufacturer's full range of available colors and patterns for each finish product.
2. After color selection submit samples representing actual product, color, and patterns.

D. Submit manufacturer’s standard warranty documentation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.05 PROJECT CONDITIONS

A. Proceed only when weather and substrate conditions permit installation in accordance with manufacturer's written instructions and when surfaces are dry and suitable to receive work.

PART 2 PRODUCTS

2.01 INSULATED METAL ROOF PANELS

A. Type: Standing Seam Roof Panels.

B. Exterior Face Metal: Minimum 24-gauge steel sheet with metallic coating and factory-applied finish.

C. Interior Face Metal: Manufacturer’s standard steel liner facing suitable for the panel system and service environment.

D. Insulation: R-29 minimum, two layer and full cavity.

E. Panel Lengths: Fabricate in longest practical lengths to minimize end laps, subject to shipping, handling, and thermal movement limitations.

2.02 FLASHINGS, TRIM, AND CLOSURES

A. Fabricate from material compatible with panels and of same finish where exposed. Provide flashing, trim, closures and other profiles indicated or required for a complete installation.

2.03 ACCESSORIES

A. General: Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer’s standard procedures and processes. Comply with indicated profiles and with dimensional and structural elements.

B. Subframing and Spacers: Where required by the retrofit design, provide galvanized cold-formed framing, bearing plates, spacers, and attachment components engineered for compatibility with the existing steel frame and the new roof panel system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine existing steel framing, supports, alignment, purlin spacing, bearing conditions, and roof geometry for compliance with requirements for installation tolerances and attachment of the insulated metal roof panel system.

3.02 PREPARATION

A. Remove existing roofing components, fasteners, deteriorated sealants, loose accessories, and obstructions as required for installation of the new work indicated.

B. Repair or replace damaged, corroded, or distorted framing members or substrate components that are not suitable to support the new system.

3.03 INSTALLATION

A. Install insulated metal roof panels and accessories in accordance with manufacturer's instructions and Drawings.

B. Fit members square against abutting components.

C. Position members plumb, square, and level.

D. Temporarily brace members until permanently fastened.

E. Align and adjust various members forming parts of a complete frame or structure after assembly but before fastening.

F. Fasten panels to supports.

G. Install flashing, trim, closures, and sealants to provide a continuous weather-resistant assembly.

3.04 PROTECTION

A. Protect installed products until completion of project.

3.05 ADJUSTMENT

A. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 42 13.19
INSULATED METAL WALL PANELS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies insulated metal wall panels and related trim, closures, sealants, fasteners, and accessories for retrofit application on an existing steel frame storage building and attachment to the existing structural support system.

1.02 SUBMITTALS

A. Submit manufacturer's technical literature for wall panels, clips, fasteners, insulation core, trim, sealants, closures, and accessories.

B. Submit layout drawings showing panel lengths, seam orientation, support spacing, trim profiles, penetrations, and attachment to the existing steel framing.

C. Samples:

1. Submit color chips showing manufacturer's full range of available colors and patterns for each finish product.
2. After color selection submit samples representing actual product, color, and patterns.

D. Submit manufacturer’s standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.04 PROJECT CONDITIONS

A. Proceed only when weather and substrate conditions permit installation in accordance with manufacturer's written instructions and when surfaces are dry and suitable to receive work.

PART 2 PRODUCTS

2.01 INSULATED METAL WALL PANELS

A. Exterior Face Metal: Minimum 26-gauge steel sheet with metallic coating and factory-applied finish.

B. Interior Face Metal: Manufacturer’s standard steel liner facing suitable for the panel system and service environment.

C. Insulation: R-25 minimum, single layer with interior vapor barrier and exterior thermal breaks.

D. Panel Lengths: Fabricate in longest practical lengths to minimize end laps, subject to shipping, handling, and thermal movement limitations.

2.02 FLASHING, TRIM, AND CLOSURES

A. Fabricate from material compatible with panels and of same finish where exposed. Provide flashing, trim, closures, and other profiles indicated or required for a complete installation.

2.03 ACCESSORIES

A. General: Fabricate and finish accessories at the factory to the greatest extent possible, by manufacturer’s standard procedures and processes. Comply with indicated profiles and with dimensional and structural elements.

B. Subframing and Spacers: Where required by the retrofit design, provide galvanized cold-formed framing, bearing plates, spacers, and attachment components engineered for compatibility with the existing steel frame and the new wall panel system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine existing wall assembly, framing, and supports for conditions affecting installation.

B. Verify existing steel framing is structurally adequate to receive new panels and accessories and is free of corrosion or deformation that would impair installation.

3.02 PREPARATION

A. Remove existing wall trims, closures, fasteners, and sealants to the extent indicated, using methods that prevent damage to existing structural framing and adjacent construction to remain.

B. Repair or replace damaged, corroded, or distorted framing members or substrate components that are not suitable to support the new system.

3.03 INSTALLATION

A. Install insulated metal wall panels and accessories in accordance with manufacturer's instructions and Drawings.

B. Set panels true to line and level, with joints properly engaged.

C. Attach panels to existing steel framing using specified fasteners and clips, tightened to manufacturer-recommended torque without overdriving.

D. Install flashing, trim, closures, and sealants to provide a continuous weather-resistant assembly.

3.04 PROTECTION

A. Protect installed products until completion of project.

3.05 ADJUSTMENT

A. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 71 23
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies fascia/eave gutters and downspouts, straps/hangers, elbows and related accessories required for a complete system.

1.02 SUBMITTALS

A. Product Data: Manufacturer’s data sheets for gutters, downspouts, accessories, fasteners, and sealants.

B. Samples: Color chip(s) and one 12-inch-long sample of gutter and downspout profile with factory finish.

C. Warranty: Manufacturer’s standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.04 PROJECT CONDITIONS

A. Proceed only when weather and substrate conditions permit installation in accordance with manufacturer's written instructions and when surfaces are dry and suitable to receive work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide products by a single manufacturer for each metal/finish type used on the Project.

2.02 MATERIALS

A. Aluminum Sheet: ASTM B209/B209M: alloy/temper suitable for forming; minimum thickness 0.032 inch for gutters and 0.027 inch for downspouts unless noted otherwise.

B. Galvanized Steel Sheet (alternate): ASTM A653/A653M; minimum G90 coating designation; thickness as required for profile stiffness but not less than 24 gage for gutters and 24 gage for downspouts unless noted otherwise.

2.03 COMPONENTS

A. Gutters: Provide outlets, end caps, miters, and expansion provisions as required. Form from one-piece lengths where practicable; otherwise provide watertight joints.

B. Downspouts: Provide elbows/offsets as required. Provide cleanouts where shown or where downspouts connect to below-grade piping.

C. Hangers/Brackets/Straps: Material compatible with gutters; provide fasteners appropriate for substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine and verify substrate suitability for product installation. Do not begin installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install gutters and downspouts in accordance with manufacturer instructions.

B. Set gutters to uniform slope toward outlets; unless otherwise indicated, provide minimum 1/16 inch per foot slope.

C. Fasten hangers/brackets to provide continuous support; space hangers not more than 24 inches o.c. (or per manufacturer) and within 6 inches of corners, end caps, and outlets.

D. Seal joints and penetrations watertight.

E. Provide downspout straps/brackets at maximum 10 feet o.c. and within 12 inches of elbows and offsets; anchor to structure.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies hollow metal doors and frames, including related reinforcements, anchors, and accessories required to complete openings.

1.02 SUBMITTALS

A. Submit manufacturer's literature for each door and frame type.
B. Door and frame schedule coordinated with Drawings; elevations; frame profiles; details of joints, anchors and reinforcements; hardware; and locations of glazing.
C. Samples:
   1. Manufacturer's color chips or small samples for factory-applied finishes.
D. Submit manufacturer's standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.
B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.04 PROJECT CONDITIONS

A. Proceed only when weather and substrate conditions permit installation in accordance with manufacturer's written instructions and when surfaces are dry and suitable to receive work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide products by a single manufacturer for doors and frames.

2.02 MATERIALS

A. Cold-rolled steel sheet: ASTM A1008/A1008M, Commercial Steel, Type B.
B. Metallic-coated steel sheet: ASTM A653/A653M, Commercial Steel, Type B, galvannealed coating for exterior openings and where indicated.
C. Fasteners: Manufacturer standard, compatible with substrates and corrosion exposure.

2.03 HOLLOW METAL DOORS

A. Thickness: 1-3/4 inch.
B. Face Sheets: Minimum 0.042 inch.
C. Core: Manufacturer standard insulation material.
D. Vision Lites: Provide each door with a factory-cut and reinforced vision panel complete with glazing stops.
E. Glazing: Provide factory-installed glazing in each vision panel.
F. Provide automatic closing device.
G. Provide a lever type self-latching key pad type lock that has been approved by the engineer.

2.04 HOLLOW METAL FRAMES

A. Frame Type: Full profile.
B. Gage: Minimum 0.053 inch.
C. Joints: Welded corners ground smooth on exposed faces.
D. Anchors: Provide anchors suitable for substrate: stud wall anchors, masonry anchors, and/or concrete anchors as required for each opening condition.
E. Reinforcements: Factory reinforce at hinges, strikes, closers, and other hardware locations.

2.05 FINISHES

A. Primer: Factory-apply rust-inhibitive prime coat.
B. Factory Color Finish: Provide manufacturer standard baked enamel or powder coat finish; color as selected.
C. Galvannealed: For exterior openings and wet/service areas where indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are within tolerance, substrates are ready, and embedded/anchorage items are in place. Do not begin installation until unsatisfactory conditions are corrected.

3.02 FRAME INSTALLATION

A. Install frames plumb, square, rigid, and true to line; brace and anchor in place per manufacturer instructions.

B. Shim at anchors as required, grout solid after frame is anchored.

3.03 DOOR INSTALLATION

A. Hang doors after frames are set and secured.

B. Install hardware, including self-latching lock and automatic closing device.

C. Adjust doors for smooth operations, proper clearances, and positive latching.

PART 4 SCHEDULE

4.01 ACCESS DOORS

A. Hollow Metal Doors

1. Manufacturer: Curries Co. (Used as Basis of Design) or equivalent.
2. Size: 36” x 84”
3. Door Thickness: 1-3/4 inches, nominal.
4. Door Face Metal Thickness: 18-gauge, 0.042 inch, minimum.
5. Vision Light Size: 8” x 36”
6. Top Closures for Outswinging Doors: Flush with top of faces and edges.
7. Door Finish: Factory finished.
   a. Color: As selected by Owner from manufacturer’s standard range.

END OF SECTION

SECTION 08 36 13
SECTIONAL DOORS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies insulated sectional overhead doors, electric door operators and controls, and operating hardware, tracks, and support.

1.02 SUBMITTALS

A. Submit manufacturer’s technical literature for doors, tracks, hardware, insulation, glazing, weatherseals, operators, controls, and safety accessories.

B. Submit layout drawings showing opening dimensions, clearances, support conditions, anchorage, track layout, operator mounting, control locations, and wiring diagrams.

C. Samples:

1. Submit color chips or small samples for factory-applied finishes.

D. Submit manufacturer’s standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original packaging with labels intact.

B. Store in a dry, protected location and handle to avoid damage to finishes, insulation, glazing, and hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

2.02 SECTIONAL OVERHEAD DOORS

A. Provide electrically operated insulated sectional overhead door assemblies sized as indicated on Drawings.

B. Door sections shall be roll-formed steel, nominal 2 inches thick, with insulated core and manufacturer’s standard interior and exterior steel facings.

C. Wind Loads: Designed to withstand uniform pressure of 20 lbf/sq. ft., acting inward and outward.

D. Provide one full-door section with factory-installed glazed vision panels. Glazing shall be clear acrylic, polycarbonate, or insulated glass as manufacturer’s standard for commercial sectional doors, set in aluminum or manufacturer’s standard rigid frames. Arrange windows evenly across the width of the designated section.

E. Provide tongue-and-groove section joints, reinforced end stiles, hinges, brackets, and attachments as required for a rigid weathertight assembly.

2.03 TRACKS, HARDWARE, AND COUNTERBALANCE

A. Provide galvanized steel tracks, brackets, rollers, hinges, shafting, cable drums, and high-strength lifting cables size for door weight and duty cycle.

B. Provide torsion spring counterbalance system designed for smooth operation and not less than 10,000 cycles.

C. Provide bottom weather seal, flexible jamb seals, and header weatherstripping for tight closure.

D. Provide lifting handles on both sides of door.

2.04 ELECTRIC OPERATORS

A. Complete with electric motor, brake, overload protection, brackets, wall mount push button control, and other accessories necessary for proper operation.

1. Make provision for emergency manual operation of door in case of electrical failure.

B. Provide photoelectric sensors across door opening and manufacturer’s standard reversing edge or monitored entrapment protection device.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings, supports, clearances, and field conditions are ready to receive work. Do not begin installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install doors, tracks, operators, controls, and accessories in accordance with manufacturer's written instructions and approved shop drawings.

B. Hang horizontal track from structural overhead framing with angle or channel hangers fastened to framing by welding or bolting or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

C. Set components plumb, level, aligned, and securely anchored. Adjust spring balance, hardware, seals, and operator limits for smooth operation and proper weather-tight closure.

D. Mount wall controls at accessible locations coordinated with Drawings and safety requirements.

PART 4 SCHEDULE

4.01 SECTIONAL OVERHEAD DOORS

A. Insulated Section Overhead Door

1. Door Size: As indicated on the Drawings.
2. Panel Thickness: 2 inches.
3. Exterior Steel: 20 gauge, galvanized.
4. Window Lites: Framed lites 24” x 12” molded plastic frame with insulated glass.
5. Exterior Surface: Flush, textured.
6. Finish and Color: Two coat baked-on polyester, white interior/exterior.

END OF SECTION

SECTION 10 73 16
EXTRUDED ALUMINUM WALL-SUPPORTED CANOPY

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies pre-engineered, wall-supported exterior door canopy system attached to a steel storage building entrance, including framing, roof deck, fascia, drainage, anchorage, flashings, sealants, accessories.

1.02 SUBMITTALS

A. Submit manufacturer’s technical literature describing canopy components, materials, finishes, dimensions, and installation requirements.

B. Samples:

1. Submit color chips showing manufacturer's full range of available colors and patterns for each finish product.

C. Submit manufacturer’s standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.04 PROJECT CONDITIONS

A. Verify actual dimensions, wall construction, structural supports, and attachment substrates before fabrication.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of design may be any pre-engineered metal canopy manufacturer capable of providing a wall-supported canopy meeting these requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Limit live load deflection to not more than L/180 unless more stringent criteria are required by code or manufacturer.

B. Slope canopy roof to shed water away from door opening and prevent ponding.

2.03 FABRICATION

A. Factory fabricate canopy components to greatest extent practical for accurate fit and minimum field assembly.

B. Provide end dams, closures, trim, and attachment provisions required for complete weather-resistant installation.

2.04 ACCESSORIES

A. Provide manufacturer’s standard brackets, splice plates, closure strips, and other accessories necessary for complete installation.

B. Where not using an enclosed gutter, provide formed drip edge to direct runoff clear of door opening and wall surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, wall framing, and support conditions for compliance with requirements for installation tolerances, structural adequacy, and conditions affecting performance.

B. Verify that backing or structural support required for anchorage is in place.

3.02 INSTALLATION

A. Install canopy plumb, level, true to line, and in accordance with manufacturer’s instructions.

B. Anchor canopy securely to structural supports; do not attach to wall cladding alone unless specifically engineered for such support.

C. Install flashings, closures, and sealants to produce a weathertight assembly at canopy-to-wall interfaces.
D. Provide positive slope away from building and door opening.

3.03 PROTECTION

A. Protect installed products until completion of project.

END OF SECTION

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies metal framing components, metal wall panels and trim, metal roof panels and trim and metal building accessories.

1.02 DESIGN CRITERIA

A. Design metal buildings to resist the dead load, the live load, and the combination of these loads as set forth in Metal Building Manufacturers Association (MBMA) “Recommended Design Practices Manual”:
   1. Roof Live Load: Thirty (30) pounds per square foot applied on horizontal projection of roof structure.
   2. Metal Building components shall be capable of supporting design loads without permanent deformation, loss of water tightness, or disengagement of any part of installation.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Complete erection drawings with identification and assembly of building components.
   2. Show anchor bolt settings, transverse cross-sections, sidewall, end wall, and roof framing, flashing and sheeting, and accessory installation details.
   3. Bear seal and signature of Registered Professional Engineer responsible for metal building system design in accordance with state law.

B. Manufacturer installation manual showing:
   1. Preparation instructions and recommendations.
   2. Installation methods.

C. Samples
   1. Submit color chips showing manufacturer’s full range of available colors and patterns for each finish product.
   2. After color selection, submit samples representing actual product, color, and patterns.

D. Submit manufacturer’s standard warranty documentation.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Protect all components and accessories from corrosion, deformation, damage and deterioration when stored at job site.

1.05 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 SYSTEM PERFORMANCE

A. Prepare submittal documents including design calculations and drawings signed and sealed by registered design professional, licensed in state of Iowa.

B. Design structural steel framing connections complying with specified performance:
   1. Load Capacity: Resist loads indicated on drawings. Resist full capacity of supported framing member. Account for connection and member loads and eccentricities.
   2. Design and detail all connections for each member size, steel grade and connection type to resist the loads and reactions indicated on the drawings or specified herein.

2.02 FABRICATION

A. Shop-fabricate framing members for field bolted assembly.

B. Surfaces of bolted connections shall be smooth and free from burrs and distortions.

C. Shop connections to conform to manufacturer’s standard design practices.

D. Mark framing members with identifying marks.

E. Welding to conform to AWS D1.1 and AWS D1.3 as applicable.

2.03 MATERIALS

A. Primary Framing Steel:

1. Hot-rolled shapes: ASTM A36 or ASTM A992, minimum yield of 36 ksi or 50 ksi.
2. Built-up sections:
   a. Webs: ASTM A572 Grade 50 or 55.
   b. Flanges: ASTM A529 Grade 55 of ASTM A572 Grade 50 or 55.

B. Secondary Framing Steel:
1. Purlins, girts, and eave struts: ASTM A1011 Grade 55, or ASTM A653, Grade 55.

C. Panels:
1. Thickness and yield strength: 26 gauge: 0.0172-inch minimum uncoated thickness, 80 ksi yield strength.
2. Fasteners:
   a. Through-fastened panels: Self-drilling with sealing washer.
   b. Standing seam panels: Long-life self-drilling with sealing washer.
   c. Ridge: Long-life self-drilling with sealing washer.
   d. Clips to purlin or bar joists: Long-life with hex washer head and washer.

2.04 PRIMARY FRAMING

A. Frame Design: Single Slope.
B. Frame Span: Clear Span.

2.05 SECONDARY FRAMING

A. Purlins: Horizontal structural members which support roof coverings.
B. Girts: Horizontal structural members that support vertical panels.

2.06 ROOF SYSTEMS

A. Type: Standing Seam Roof Panels.
1. Panel profile: 0.75:12 minimum roof slope.
2. Exterior Panel:
   a. Sheet Thickness: 24 gauge.
   b. Finish: Galvalume.
   c. Color: Selected from manufacturer standard colors.
3. Interior Panel:
   a. Sheet Thickness: 29 gauge.
   b. Color: White.
4. Provide metal panel systems capable of withstanding the effects of 90 mph wind loads.
5. Hail Resistance: MH.
6. No water penetration when tested according to ASTM E1646 or ASTM E331 at a pressure differential of 2.86 psf.

2.07 WALL, LINER, AND SOFFIT

A. Wall Panels:
1. Exterior Panel:
   a. Sheet thickness: 26 gauge.
   b. Color: Selected from manufacturer standard colors.
2. Interior Panel:
   a. Sheet thickness: 29 gauge.
   b. Color: White.
3. Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joints sealants, failure of connections, and other detrimental effects.

B. Flashing, Trim and Closures:
1. Same material, gage and finish as adjacent wall and roof panels.
2. Form or mold closure strips to match configuration of the roofing or siding.
3. Install closures wherever necessary to ensure weather tight construction.

2.08 INSULATION

A. Roof Insulation: R-29 minimum, two layer and full cavity.
B. Wall Insulation: R-25 minimum, single layer with interior vapor barrier and exterior thermal breaks.
C. Insulation Types: Provide one insulation type for each application.

2.09 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicted profiles and with dimensional and structural elements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine supporting foundations for compliance with manufacturer's requirements, including installation tolerances and other conditions affecting performance of supporting members.

B. Check installed anchor bolts for accuracy. Verify that bearing surfaces are ready to receive the work.

C. Verify the rough-in of required mechanical and electrical services prior to placement of the structure.

3.02 PREPARATION

A. Clean surfaces prior to installation.

B. Prepare surfaces using methods recommended by the manufacturer for best result for substrate.

3.03 INSTALLATION

A. Install system in accordance with manufacturer's instructions and approved Shop Drawings.

B. Fit members square against abutting components.

C. Position members plumb, square, and level.

D. Temporarily brace members until permanently fastened.

E. Align and adjust various members forming parts of a complete frame or structure after assembly but before fastening.

F. Welding to conform to AWS D1.1.

G. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

H. Fasten panels to supports.

I. Install trim to maintain visual continuity of system.

J. Install joint sealants and gaskets to prevent water penetration.

3.04 PROTECTION

A. Protect installed products until completion of project.

3.05 ADJUSTMENT

A. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 22 40 00
PLUMBING FIXTURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies mop service basins, service sink faucets, hose bibbs, carriers and related domestic water, sanitary waste and vent pipe construction required for a complete installation.

1.02 SUBMITTALS

A. Submit manufacturer's technical literature for mop sink, faucet, hose bibb, trim, supports, and accessories. Include manufacturer's installation instructions and rough-in requirements.

B. Submit manufacturer's standard warranty documentation.

PART 2 PRODUCTS

2.01 MOP SINK

A. Provide floor-mounted mop service basin of plastic or molded composite construction, minimum 24" x 24" and approximately 14 inches deep, with abrasion-resistant surface and integrally formed drain outlet. Provide stainless steel drain assembly and strainer suitable for connection to sanitary waste piping.

2.02 SERVICE SINK FAUCET AND ACCESSORIES

A. Provide exposed wall-mounted service sink faucet with solid brass construction, integral stops, adjustable wall brace, and threaded spout for hose connection.

B. Heavy-duty single lever handle, center set (other options as approved by engineer).

2.03 HOSE BIBB

A. Single faucet, wall mounted.

B. Locations: As shown on Drawings (confirm location with engineer prior to installation)

C. Cast or wrought copper alloy, combination faucet with replaceable Monel seat, removable replacement unit containing all parts subject to wear, mounted on wall 36 inches above floor.

D. Where subject to freezing conditions, provide frost-resistant wall hydrant type.

2.04 APPURTENANCES

A. Provide stops, trap, supports, blocking, anchors, sealants, sleeves, pipe hangers, and connection materials required for a complete and leak-free installation.

B. Provide domestic water, sanitary waste, and piping materials and fittings compatible with the building plumbing systems and suitable for the service indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify rough-in dimensions and service locations before installation.

3.02 INSTALLATION

A. Location of piping, sleeves, inserts, hangers, equipment, and access provisions shall be coordinated with the work of all trades.

B. Piping, sleeves, inserts, hangers, and equipment shall be located clear of windows, doors, openings, light outlets, and other services and utilities.

C. Generally, small diameter pipe runs from drips and drains, water cooling, and other service are not shown but must be provided.

D. Branch piping shall be installed for waste from the respective piping systems and connect to all fixtures, valves, cocks, outlets, casework, cabinets and equipment.

E. Pipe shall be round and straight.

F. Install mop sink level and securely supported, with joints sealed watertight at adjoining wall and floor surfaces.

G. Install hose bibbs plumb, rigid, and at mounting heights indicated.

H. Connect fixtures to domestic water and sanitary waste systems with approved fittings and without strain on piping or fixture bodies.

3.03 CLEANING AND PROTECTION

A. Clean exposed surfaces, remove labels and debris, and leave fixtures in operating condition.

B. Protect installed fixtures and trim from damage until Final Acceptance.

C. Replace cracked, chipped, stained, or otherwise damaged components before project closeout.

END OF SECTION

SECTION 23 11 23
FACILITY NATURAL-GAS PIPING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies above-grade natural gas piping from the point indicated on the Drawings to the gas-fired unit heaters, including shutoff valve, union, sediment trap, pressure regulator where required, equipment connector where permitted, and accessories required for a complete and operable installation.

1.02 SUBMITTALS

A. Submit manufacturer’s technical literature for pipes, fittings, valves, regulators, supports, and identification materials.

B. Submit manufacturer’s technical literature for the unit heater gas connection requirements, venting requirements, minimum inlet gas pressure, maximum inlet gas pressure, and required clearances.

PART 2 PRODUCTS

2.01 PIPING MATERIALS

A. Above grade interior piping shall be ASTM A53 Schedule 40 black steel pipe with malleable iron threaded fittings for 2 inches and smaller.

B. Provide pipe joint compound or thread sealant listed for natural gas service.

2.02 VALVES AND SPECIALTIES

A. Provide full-port quarter-turn ball valves rated for fuel gas service.

B. Provide a manual shutoff valve at each unit heater, installed accessible and within the same bay as the appliance.

C. Provide union downstream of the shutoff valve and upstream of the equipment connection.

D. Provide sediment trap at each appliance connection as required by code.

E. Provide regulators where utility or equipment pressure conditions require pressure reduction.

2.03 SUPPORTS

A. Provide hangers, anchors, and supports suitable for gas piping service and building construction. Support piping to maintain alignment, prevent sagging, and avoid stress on equipment connections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify the unit heater input rating, gas type, elevation setting if applicable, and required inlet pressure before connection.

B. Install shutoff valve, union, and sediment trap in the sequence required by code and the heater manufacturer.

3.02 INSTALLATION

A. Install piping concealed or exposed as indicated and coordinated with structure, doors, lighting, and heater mounting height.

B. Route piping as high as practical in the storage building and protect from vehicle impact and physical damage.

3.03 STARTUP AND ADJUSTING

A. Confirm that safety controls operate correctly and that no gas leaks are present at final operating pressure.

END OF SECTION

SECTION 23 34 00
OVERHEAD PROPELLER FAN

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies overhead-mounted propeller fans complete with motors, mounting hardware, and controls for ventilation of the storage building as indicated on the drawings and specified herein.

1.02 SUBMITTALS

A. Submit manufacturer's technical literature for each fan including size, airflow, motor horsepower, voltage, full-load amps, speed, accessories, dimensions, weights, mounting requirements, and manufacturer installation instructions.

B. Submit shop drawings indicating mounting elevations, structural attachment points, power connection requirements, and control wiring diagrams.

C. Submit manufacturer's standard warranty documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in original packaging

B. Store clean, dry, and protected from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with these specifications, provide products by a recognized manufacturer of industrial propeller fans.

2.02 FAN ASSEMBLY

A. Provide overhead propeller fan suitable for suspended installation in a storage building.

B. Fan housing and mounting components shall be fabricated steel with factory-applied corrosion-resistant finish.

2.03 MOTORS AND DRIVES

A. Motors shall be continuous-duty, premium efficiency where available.

B. Provide totally enclosed fan-cooled motors for dusty or damp storage building conditions.

C. Provide direct-drive fans.

2.04 ELECTRICAL ACCESSORIES AND CONTROLS

A. Provide factory-mounted junction box.

B. Provide wall switch and speed controller.

C. Control components shall be compatible with motor type and horsepower.

2.05 SUPPORTS

A. Provide manufacturer-recommended support brackets, hanging hardware, and structural attachment accessories sized for imposed deadload and operating forces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that supports, power rough-in, clearances, and mounting conditions are satisfactory for installation. Do not install equipment until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install fans plumb, level, and secure in accordance with manufacturer instructions.

B. Suspend or mount fans from structural members only; do not support from nonstructural framing unless specifically designed for the load.

C. Coordinate final mounting height and orientation to avoid interference with stored materials, doors, lighting, and other building systems.

3.03 STARTUP AND ADJUSTING

A. Observe startup and correct as necessary for air balance work.

END OF SECTION

SECTION 23 55 33.16
GAS-FIRED UNIT HEATERS

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies the suspended, vented, natural-gas-fired unit heaters for heating a storage building and related specialties including venting, combustion air piping where required, gas connection components, thermostats, and equipment supports.

1.02 SUBMITTALS

A. Submit manufacturer’s technical literature for each heater, including capacities, dimensions, electrical characteristics, gas connection size, venting requirements, controls, discharge air pattern accessories, clearances to combustibles, and installation instructions.

B. Submit manufacturer's startup instructions.

C. Submit manufacturer's standard warranty documentation.

PART 2 PRODUCTS

2.01 UNIT HEATER

A. Provide factory-assembled, power-vented or separated-combustion, propeller-fan type natural-gas-fired unit heaters suitable for commercial storage occupancy.

B. Units shall be designed for suspension from building structure.

C. Heater casing shall be heavy-gage steel with corrosion-resistant finish.

D. Burners shall be in-shot or tubular type as standard with direct spark ignition, combustion air proving, high-temperature limit protection, and flame safeguard controls.

E. Provide low-voltage wall thermostat for each heater unless indicated otherwise.

2.02 VENTING AND COMBUSTION AIR

A. Provide manufacturer-approved vent connector materials, termination kits, concentric vent kit if scheduled, sidewall or roof terminal assemblies, and combustion air inlet components required for the selected heater arrangement.

2.03 ACCESSORIES

A. Provide adjustable discharge louvers, hanger kits, threaded rod supports, vibration isolation where recommended by the manufacturer, thermostat guards where indicated, and identification labels.

B. Furnish roof or wall penetration accessories, flashing, sleeves, and closure materials as required for a weather-tight and code-compliant installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify building dimensions, structure, mounting elevations, utility rough-ins, gas pressure availability, electrical service characteristics, and vent routing conditions before installation.

3.02 INSTALLATION

A. Install unit heaters as shown on Drawings level and securely supported from structural members in accordance with manufacturer instructions.

B. Coordinate final location to avoid interference with doors, lights, storage racks, overhead tracks, and vehicle circulation.

C. Connect natural gas piping with sediment trap, shutoff valve, union, and pressure test protection for appliance gas valves.

D. Install venting and combustion air piping with required slope, support, firestopping, and weatherproof terminations.

E. Provide electrical power and control wiring under the appropriate division of the specifications.

3.03 STARTUP AND ADJUSTING

A. Assist with startup of the unit heater and verify proper burner operation, inlet pressure, manifold pressure where adjustable, ignition sequence, and thermostat operation.

END OF SECTION

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies electrical systems, materials, equipment, and accessories in accordance with the specifications and Drawings.

B. Electrical service entrance equipment and arrangements for temporary and permanent connections to the electric utility company's system shall conform to the electric utility company's requirements. Coordinate fuses, circuit breakers and relays with the electric utility company's system, and obtain electric utility company approval for sizes and settings of these devices.

C. Drawings are necessarily diagrammatic by their nature and are not intended to show every connection in detail or every conduit in its exact location. Carefully investigate structural and finish conditions and coordinate the separate trades in order to avoid interference between the various phases of work.

D. The intent of the Drawings is to establish the types of systems and functions; not to set forth each item essential to the functioning of the system.

1.02 MINIMUM REQUIREMENTS

A. The latest International Building Code (IBC), Underwriters Laboratories, Inc. (UL), Institute of Electrical and Electronics Engineers (IEEE), and National Fire Protection Association (NFPA) codes and standards are the minimum requirements for materials and installation.

B. Fifty-five (55) foot candle light intensity measurement shall be produced throughout the shop.
   1. Light intensity measurement shall be at floor level.

1.03 WORK PERFORMANCE

A. Job site safety and worker safety is the responsibility of the Contractor.

B. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions.

C. Coordinate location of equipment and conduit with other trades to minimize interference.

1.04 SUBMITTALS

A. For LED lighting fixtures, submit US DOE LED Lighting Facts label, and IES L70 rated life.

B. Lamp data including lumen output, color rendition index, rated life, and color temperature.

C. Submit manufacturer's standard warranty documentation.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide new products of manufacturers regularly engaged in production of such equipment.

B. Provide the manufacturer's latest standard design for the type of product specified.

2.02 PANELBOARDS

A. Panelboards shall be in accordance with NEC, NEMA, and UL.

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

C. Panelboards shall be factory-assembled with molded case circuit breakers.

D. 200 amp electrical service.

E. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

2.03 SPLICES AND TERMINATIONS

A. Materials shall be compatible with the cables being spliced and terminated, and shall be suitable for the prevailing environmental conditions.

B. Provide insulated cable supports to relieve any strain imposed by cable weight or movement. Ground cable supports to the grounding system.

2.04 CONDUCTORS

A. All conductors shall be copper.

2.05 WALL SWITCHES, RECEPTACLES, AND WALL PLATES

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
C. Provide FGCI protection for receptacles installed within 6 feet of sinks.
D. Provide GFCI protection for receptacles installed in bathrooms.
E. Unless noted otherwise, do not use combination switch/receptacle devices.

2.06 OUTLET, JUNCTION, AND PULL BOXES

A. UL-50 and UL-514A
B. Rustproof cast metal where required by the NEC or shown on Drawings.
C. Sheet Metal Boxes: Galvanized steel, except where shown on Drawings.

2.07 FIERPROOFING TAPE

A. Fireproofing tape shall be flexible, non-corrosive, self-extinguishing, arcproof, and fireproof intumescent elastomer.

2.08 220v HARDWIRE

A. All wiring and accessories to accommodate a 220v air compressor shall be made available on an exterior wall above the warm-up room at an approved location.

2.09 LED LIGHT FIXTURES

A. Light emitting diode (LED) light fixtures shall be in accordance with IES, NEPA, UL, as shown on the Drawings, and as specified.
B. Housing, LED driver, and LED module shall be products of the same manufacturer.

2.10 EQUIPMENT WIRING SYSTEMS FOR FANS AND UNIT HEATERS

A. Provide branch-circuit power connections, disconnecting means, controllers, and final terminations for electrically powered fans and for control and fan motors associated with natural-gas-fired unit heaters.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Installation shall be in accordance with the NEC, as shown on the Drawings, and per manufacturer's instructions.
B. Cable shall be installed in conduit above grade and duct bank below grade.
C. All cable of a feeder shall be pulled simultaneously.
D. Conductors of different systems shall not be installed in the same raceway.
E. Cable maximum pull length, maximum pulling tension, and minimum bend radius shall conform with the recommendations of the manufacturer.
F. Use suitable lubricating compounds on the cables to prevent pulling damage.
G. Install wall switches forty-eight inches above floor, with the toggle OFF position down.
H. Install wall outlets eighteen inches above floor.

3.03 PANELBOARD INSTALLATION

A. Locate panelboards so that the present and future conduits can be conveniently connected.

3.04 CONTROL WIRING INSTALLATION

A. Unless otherwise specified in other sections, install control wiring and connect to equipment to perform the required functions as specified or as shown on the drawings.
B. Install a separate power supply circuit for each system, except where otherwise shown on the drawings.

3.05 DIRECT BURIAL CABLE INSTALLATION

A. Tops of the cables:
   1. Below the finished grade: Minimum thirty-six (36) inches unless greater depth is shown.
B. Install cables in rigid conduits. Conduits not less than two (2) inches trade size with bushings at each end of each conduit run.
C. Work with extreme care near existing ducts, conduits, cables, and other utilities to prevent any damage.
D. Install the cables in continuous lengths. Splices within cable runs shall not be accepted.

3.06 RACEWAY

A. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
B. Install equipment grounding conductors with all feeders, and power and lighting branch circuits.
C. Ground lighting fixtures to the equipment grounding conductor of the wiring system. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

3.07 EXPOSED WORK INSTALLATION

A. Align and run conduit parallel or perpendicular to the building lines.
B. Support horizontal or vertical runs at not over eight (8) feet.

3.08 LED LIGHT FIXTURE INSTALLATION

A. Installation shall be in accordance with the NEC, manufacturer's instructions, and as shown on the Drawings or specified.
B. Align, mount, and level the lighting fixtures uniformly.
C. Lighting Fixture Supports:
    1. Shall provide support for all of the fixtures. Supports may be anchored in channels of the ceiling construction, to the structural members.
    2. Shall maintain the fixture positions after cleaning and relamping.
    3. Shall support the lighting fixtures without causing the ceiling or partition to deflect.
D. Single or double pendant-mounted lighting fixtures:
    1. Each stem shall be supported by an approved outlet box mounted swivel joint and canopy which holds the stem captive and provides spring load dampening of fixture oscillations. Outlet box shall be supported vertically from the building structure.
E. Outlet boxes for support of lighting fixtures (where permitted) shall be secured directly to the building structure with approved devices.
F. The electrical and building trades shall coordinate to ascertain that approved lighting fixtures are furnished in the proper sizes and installed with the proper devices (hangers, clips, trim frames, flanges, etc.).

3.09 FANS AND UNIT HEATERS INSTALLATION

A. Provide power wiring complete to each fan and unit heater, including control wiring not factory furnished but required for operation.

3.10 ACCEPTANCE CHECKS AND TESTS

A. Perform tests in accordance with the manufacturer's recommendations.
B. Visual Inspection:
    1. Inspect exposed sections of cables for physical damage.
    2. Inspect shield grounding, cable supports, splices, and terminations.
C. Electrical Tests:
    1. Acceptance tests shall be performed.
    2. Test new cables after installation, splices, and terminations have been made.

END OF SECTION

SECTION 26 52 13
EMERGENCY AND EXIT LIGHTING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies emergency lighting units, internally illuminated exit signs, and accessories for means-of-egress illumination serving the storage building.

1.02 REQUIREMENTS

A. Provide a complete emergency lighting system to illuminate the required path of egress upon loss of normal power.

B. Equipment shall energize automatically within 10 seconds of interruption of normal power and shall provide not less than 90 minutes of emergency operation.

C. Size, locate, and aim units to achieve required illumination at exits, exit access, aisles, corridors, exterior discharge points, and other designated egress components.

1.03 SUBMITTALS

A. Submit manufacturer’s technical literature for each type of emergency lighting unit, exit sign, and accessory.

B. Submit manufacturer's standard warranty documentation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store packaged products in original, unopened packaging until ready for installation.

B. Store equipment in a clean, dry location protected from damage, moisture, and temperature extremes.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide LED-based emergency lighting equipment with solid-state charger, maintenance-free batteries, test switch, status indicator, and low-voltage disconnect to protect batteries from deep discharge.

B. Equipment shall be factory assembled, wired, and tested.

C. Provide universal mounting accessories as required for wall, ceiling, or end mounting.

2.02 EXIT SIGNS

A. Internally illuminated LED exit signs shall be UL 924 listed, suitable for AC operation with integral battery backup where shown or required, and configured with field-selectable directional chevrons where applicable.

B. Letters shall be a minimum of 6 inches high with minimum 3/4-inch stroke width unless stricter local requirements apply.

C. Units shall include automatic transfer to battery upon loss of normal power, battery charger, test switch, and indicator light.

2.03 EMERGENCY LIGHTING UNITS

A. Emergency lighting units shall consist of LED lamp heads mounted on a housing containing battery, charger, transfer electronics, and controls.

B. Heads shall be adjustable and capable of being aimed to illuminate the path of egress.

C. Light output shall be adequate to achieve required illumination levels for the mounting height and spacing used.

D. Provide units suitable for the mounting conditions indicated.

2.04 ACCESSORIES

A. Provide all mounting brackets, canopies, wire guards, labels, remote heads, stems, and other accessories required for a complete installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify mounting surfaces, branch circuit availability, environmental conditions, and conflicts with doors, shelving, overhead doors, or stored materials before installation.
B. Do not install damaged equipment or equipment not suitable for the actual site conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Installation shall meet or exceed all applicable federal, state, and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
C. Mount units plumb and secure.
D. Arrange equipment to provide unobstructed visibility of exit signs and effective illumination of the means of egress.
E. Connect emergency lighting to the designated unswitched branch circuit ahead of local switching unless otherwise required by code.
F. Install exit signs above required exit doors and at changes in direction along the egress route where line of sight to the next exit sign is not maintained.

3.03 PROTECTION

A. Protect installed products until completion of project.

3.04 ADJUSTMENT

A. Adjust and aim lamp heads to maximize egress path illumination after all equipment, shelving, and obstructions are in final position.

END OF SECTION