ADDENDUM

OWNER	**WESTERN WAYNE SCHOOLS**
PROJECT	WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS – BID PACKAGE #1 A/E Project 5-6394
PURPOSE	**ADDENDUM 002** THIS ADDENDUM SHALL FORM PART OF THE BIDDING DOCUMENTS. CHANGES, ADDITIONS, CLARIFICATIONS OR DELETIONS HEREIN SUPERSEDE THE DRAWINGS AND SPECIFICATIONS. BIDDERS SHALL INCLUDE ON THE PROPOSAL FORM ACKNOWLEDGEMENT OF THE RECEIPT OF THIS ADDENDUM.
ATTACHMENTS	**New Specifications: 23 09 23, 23 09 93** **Reissued Specifications: Table of Contents, 04 20 00, 12 66 13, 22 10 05,** **Reissued Sheets: G1.01, C1.01, C3.01, C7.01, A1.1A, A2.1A, A2.81, A8.01, M2.1A, M9.01, E2.1A, E3.1A, E5.01, E5.10, ES2.01**
ARCHITECT-ENGINEER	**GMB** www.gmb.com 616.796.0200

SPECIFICATION CLARIFICATIONS / REVISIONS

ITEM NO. 1 SECTION TABLE OF CONTENTS **(REISSUED)**

Refer to Table of Contents for new spec sections 23 09 23 and 23 09 93.

ITEM NO. 2 SECTION 04 20 00 UNIT MASONRY (**REISSUED**)

Refer to Part 2.2 B for revision to brick texture.

ITEM NO. 3 SECTION 12 66 13 TELESCOPING BLEACHERS (**REISSUED**)

Refer to Section 2.05 for revisions to section “Seating Fabrication.”

ITEM NO. 4 SECTION 22 10 05 PLUMBING PIPING (**REISSUED**)

Revised section to include PVC piping as an approved material for aboveground sanitary waste and vent piping. Refer to 3.3, C. and 4.8 part 2.

ITEM NO. 5 SECTION 23 09 23 DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC **(NEW)**

New spec section issued.

ITEM NO. 6 SECTION 23 09 93 SEQUENCE OF OPERATIONS FOR HVAC CONTROLS **(NEW)**

New spec section issued.

ITEM NO. 7 RFI RESPONSES **(NEW)**

See attached PDF.

SHEET CLARIFICATIONS / REVISIONS

ITEM NO. 8 SHEET G1.01 – CODE COMPLIANCE PLAN (**REISSUED**)

Revised the sheet to take away the code compliance graph.

ITEM NO. 9 SHEET C1.01 – SITE DEMOLITION SHEET (**REISSUED**)

Revise the line of sawcut through the parking lot for the new electrical feed as shown on sheet.

ITEM NO. 10 SHEET C3.01 – SITE GRADING, DRAINAGE, & UTILITY PLAN (**REISSUED**)

A. Add the site electrical feed as shown on the attached revised sheet C3.01.

B. Revise the storm drainage for the roof drains as shown on the attached revised sheet C3.01.

ITEM NO. 11 SHEET C7.01 – STORMWATER POLLUTION PREVENTION PLAN (**REISSUED**)

Revise the site construction limits and erosion control as shown on the attached revised sheet C7.01.

ITEM NO. 12 SHEET A1.1A – UNIT 'A' FIRST FLOOR DEMOLITION PLAN (**REISSUED**)

Reduction in scope of Northwest stairwell, refer to plan for more details

ITEM NO. 13 SHEET A2.1A – UNIT 'A' FIRST FLOOR PLAN (**REISSUED**)

A. Reduction in scope of Northwest stairwell, refer to plan for more details.

B. Added dimensions strings to the award storage.
C. Revised elevation call outs for Hospitality Room.

ITEM NO. 14 SHEET A2.81 – ENLARGED PLANS (**REISSUED**)

Revised elevation call outs for Concession A128.

ITEM NO. 15 SHEET A8.01 – INTERIOR ELEVATIONS (**REISSUED**)

A. New elevations for A128 Concessions.

B. Moved elevations for hospitality to sheet.

ITEM NO. 16 SHEET M2.1A – UNIT 'A' FIRST FLOOR HVAC PLAN (**REISSUED**)

A. Transfer ducts modified.

B. Return Grilles added.

ITEM NO. 17 SHEET M9.01 – MECHANICAL SCHEDULES (**REISSUED**)

Clarified OA scope.

ITEM NO. 18 SHEET E2.1A - UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN **(REISSUED)**

A. Removed power requirements for new chair lift.

B. Changed circuit number for EF-6.

ITEM NO. 19 SHEET E3.1A - UNIT 'A' FIRST FLOOR LIGHTING PLAN **(REISSUED)**

Revised lighting layout. Refer to sheet for changes.

ITEM NO. 20 SHEET E5.01 - POWER DISTRIBUTION EQUIPMENT SCHEDULES **(REISSUED)**

Revised schedule for panelboard 'AA'.

ITEM NO. 21 SHEET E5.10 - LIGHTING FIXTURE SCHEDULE **(REISSUED)**

A. Added equal lighting fixtures to Lighting Fixture Schedule.

B. Revised Lighting Control Intent Narrative (CIN) Schedule.

ITEM NO. 22 SHEET ES2.01 – SITE ELECTRICAL PLAN (**REISSUED**)

Conduit run from new transformer shifted Easterly to be 3' from the curb, per owner's request, reference ES2.01.

SECTION 00 01 10 - TABLE OF CONTENTS

(ADDENDUM 001) (ADDENDUM 002)

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END OF SECTION

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SECTION 04 20 00 - UNIT MASONRY

(ADDENDUM 001) ADDENDUM 002

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete block.
B. Concrete facing brick.
C. Clay facing brick.
D. Ceramic glazed structural clay facing tile
E. Mortar and grout.
F. Reinforcement and anchorage.
G. Flashings.
H. Lintels.
I. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 04 01 00 - Maintenance of Masonry.
B. Section 05 50 00 - Metal Fabrications: Loose steel lintels.
C. Section 07 21 00 - Thermal Insulation: Insulation for cavity spaces.
D. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
E. Section 07 84 00 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
F. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement.
E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
F. ASTM C55 - Standard Specification for Concrete Building Brick.
G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
H. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
I. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
J. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
K. ASTM C150/C150M - Standard Specification for Portland Cement.
L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
M. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
N. ASTM C270 - Standard Specification for Mortar for Unit Masonry.

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O. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.

P. ASTM C476 - Standard Specification for Grout for Masonry.

Q. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

R. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete.

S. ASTM C1634 - Standard Specification for Concrete Facing Brick and Other Concrete Masonry Facing Units.

T. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing.

U. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls.

V. BIA Technical Notes No. 46 - Maintenance of Brick Masonry.

W. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide nonstandard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions.
      a. Provide bullnose units for outside corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Provide units with minimum average net-area compressive strength of 2500 psi
         1) Hollow block, as indicated.
         2) Exposed Faces: Manufacturer's standard color and texture where indicated.
   4. Nonloadbearing Units: ASTM C129.
      a. Provide units with minimum average net-area compressive strength of 2500 psi
         1) Hollow block, as indicated.
         2) Normal weight.

B. Concrete Brick:
   1. Size: As indicated on drawings.
      a. Provide units with minimum average net-area compressive strength of 2500 psi.
   2. Concrete Facing Brick: ASTM C1634; solid, lightweight; for architectural, paver, and below grade use.
      a. Exposed Faces: Color and texture to match Architect's sample.

2.2 BRICK UNITS

A. Manufacturers:

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1. Belden Brick; Commodore Full Range Velour: www.beldenbrick.com/#sle.

B. Facing Brick: ASTM C216, Type ~~FBS Smooth~~FBX, Grade SW.
   1. Color and texture to match Architect's sample.
   2. Nominal size: 3 5/8" W x 7 5/8" L.
   3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
   1. Not more than 0.10 percent alkali when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Aggregate: ASTM C144.

D. Grout Aggregate: ASTM C404.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As indicated on drawings.

F. Water: Clean and potable.

2.4 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
   1. Hohmann & Barnard, Inc; X-Seal Anchor: www.h-b.com/#sle.
   2. Masonry Reinforcing Corporation of America: www.wirebond.com
   3. Heckmann Building Products, Inc.: http://www.heckmannbuildingprods.com/

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; galvanized.

C. Single Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Truss or ladder.
   2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
   3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.

D. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Ladder, with adjustable ties or tabs spaced at 16 in on center.
   2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M Class B.
   3. Size: 0.1483 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1483 inch inch wire, width of components as required to provide not less than 5/8 inch of mortar coverage from each masonry face.
   4. Vertical adjustment: Not more than 2 inches.
   5. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of inner wythe of masonry.

E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.

F. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.

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2.5 FLASHINGS

2.6 LINTELS

A. Precast Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 03 30 00 "Cast-in-Place Concrete" and with reinforcing bars indicated.

B. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout (entire height of lintel to be filled in one pour). Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

C. Brickwork Support System: Offset steel relief angles or lintels with hanger brackets for support of brickwork above horizontal masonry joints and openings to allow insulation to span continuously behind brick and eliminate continuous thermal bridges associated with support systems that interrupt continuous insulation.

2.7 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Exterior, loadbearing masonry: Type S.
   2. Exterior, non-loadbearing masonry: Type S.
   3. Interior, loadbearing masonry: Type S.
   4. Interior, non-loadbearing masonry: Type S.
   5. Masonry veneer: Type N
   6. For other applications where a type is not listed use Type S

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

3.2 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.4 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

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D. Brick Units:
   1. Bond: Running.
   2. Coursing: Three units and three mortar joints to equal 8 inches.
   3. Mortar Joints: Concave.

3.5 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Remove excess mortar and mortar smears as work progresses.

D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

E. Interlock intersections and external corners, except for units laid in stack bond.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.6 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

B. Install cavity vents in veneer and cavity walls at 24 inches on center horizontally below shelf angles and lintels and near top of walls.

3.7 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.

D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.8 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 12 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.

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E. Lap joint reinforcement ends minimum 6 inches.

F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

G. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.9 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 18 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.10 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Use individual metal ties installed in horizontal joints to bond wythes together. Provide ties spaced as indicated on drawings.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

3.11 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 6 inches, minimum, to form watertight pan at nonmasonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Terminate flashing up 8 inches minimum on vertical surface of backing:
   1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.

C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

D. Extend metal flashings to within 1/4 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

E. Lap end joints of flashings at least 4 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.12 LINTELS

A. Install loose steel lintels over openings where indicated.

B. Install reinforced unit masonry lintels over openings where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

C. Maintain minimum 8 inch bearing on each side of opening unless otherwise noted.

D. Install thermal brick support system in accordance with manufacturer’s instructions at locations indicated on drawings

3.13 GROUTED COMPONENTS

A. Reinforce bond beams with 2, No. 5 bars, 1 inch from bottom web.

B. Lap splices minimum 24 bar diameters.

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C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

D. Place and consolidate grout fill without displacing reinforcing.

E. At bearing locations, fill masonry cores with grout for a minimum 24 inches either side of opening.

3.14 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

C. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

D. Form expansion joints in brick as follows:
   1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal exapsion joints if any.
   2. Build flanges of factory-fabricated, expansion joints in masonry
   3. Build in compressible joint fillers where indicated.
   4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 07 92 00 "Joint Sealants"

E. Provide horizontal, pressure-reliving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 07 92 00 "Joint Sealants", but not less than 3/8 inch.
   1. Locate horizontal, pressure-releaving joints beneath shelf angles supporting masonry.

3.15 BUILT-IN WORK

A. As work progresses, install built-in metal door frames, glazed frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

3.16 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation from Alignment of Columns: 1/4 inch.

C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

F. Maximum Variation from Level Coursing: 1/4 inch in 10 ft; 3/8 inch in 20 ft.

G. Maximum Variation of Mortar Joint Thickness: Bed joint, minus 1/8 inch, plus 1/8 inch with maximum thickness of 1/2 inch.

3.17 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

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B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.

C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.19 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

3.20 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

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SECTION 12 66 13 - TELESCOPING BLEACHERS

(ADDENDUM 002)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Telescoping Stands includes, either manually or electrically operated systems of multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.

1. Typical applications include the following:
    a. Wall Attached Telescoping Gym Seats.
    b. All Labor to be provided at the prevailing wage rate of the school location.
    c. 5 year warranty to be included in price.
    d. Bleachers must have seat count as noted in the Product Description.
    e. Provide open and closed limit switches.
    f. Bidder to have service personnel located in the State of Indiana. Provide persons name and address with bid.
    g. Bidder to provide proof that the installing company has insurance to install Telescoping Bleacher
    h. Provide 1st Row that can be manual opened when Bleachers are in the closed position for Gym classes on Wall Attached Bleachers.
    i. All ADA positions to be recoverable and provide 14 different locations for the ADA positions to be located.
2. Special applications include the following:
    a. Rear Wall Column Cutouts Telescoping Gym Seats.

B. Related Sections:

1. Division 9 finishes sections for adequate floor & wall construction for operation of Telescoping Gym Seats. Flooring shall be level and rear wall plumb within 1/8" [3mm] in 8'-0 [2438mm]. Maximum bleacher force on the floor, of a 25'-6" [7772] section, shall be a static point load of less than 300 psi [2.068 N/mm^2].
2. Division 16 Electrical sections for electrical wiring and connections for electrically operated Telescoping Gym Seats.

C. BIDDER QUALIFICATIONS

1. Bidders are required to be an authorized dealer or manufacturer for equipment proposed which on a day-to-day basis regularly provide the equipment offered. Bidders are further advised that only standard production models or standard options will be acceptable for award. Equipment offered shall be currently manufactured on an active assembly line. The Owner is only interested in proven equipment; provided, installed, and serviced by Authorized Dealers capable of providing references.

D. INSTALLER QUALIFICATIONS:

1. Bleacher installer shall be Factory Certified by the Manufacturer. Proof of Factory Certified Installation_Certificate shall be provided along with the Invitation to Bid. Failure to provide this information shall result in rejection of bid. (No Exceptions Taken)

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E. SERVICE CAPABILITY:

1. The Bleacher Contractor must be able to show proof of full time service capability by factory certified technicians directly employed by the Bleacher Contractor. Sub-Contractors of the Bleacher Contractor or Factory Technicians located outside of the State do not qualify under this service response requirement. Adequate and satisfactory availability of repair parts and supplies, and ability to meet warranty and service requirements are a requirement of this Invitation to Bid. The Owner reserves the right to satisfy itself by inquiry or otherwise as to bidder's capabilities in this regard. A four (4) to eight (8) hour maximum on-site repair response is required during normal working hours, 8 a.m. to 5 p.m. weekdays (excluding holidays) All Full Time Service Personnel shall be Factory Authorized and Trained. Proof of Service Capability along with a listing of service parts regularly maintained in inventory shall be provided along with the Invitation for Bid. Failure to provide this information shall result in rejection of bid.

1.2 REFERENCES

A. International Building Code (IBC)

B. ICC 300 – Standard for Bleachers, Folding and Telescopic Seating and Grandstands

C. National Fire Protection Association (NFPA)

1. NFPA 102 Standard for Assembly Seating, Tents and Membrane Structures.

D. American Welding society (AWS):

1. AWS D1.1 Structural Welding Code - Steel.
2. AWS D1.3 Structural Welding Code - Sheet Steel.

E. American Institute of Steel Construction (AISC):

1. AISC - Design of Hot Rolled Steel Structural Members.

F. American National Standards Institute (ANSI).

G. American Iron & Steel Institute (AISI):

1. AISI - Design Cold Formed Steel Structural Members.

H. Aluminum Association (AA):

1. AA - Aluminum Structures, Construction Manual Series.

I. American Society for Testing Materials (ASTM):

1. ASTM - Standard Specification for Properties of Materials.

J. National Forest Products Association (NFoPA):

1. NFoPA - National Design Specification for Wood Construction.

K. Southern Pine Inspection Bureau (SPIB):

1. SPIB - Standard Grading Rules for Southern Pine.

L. National Bureau of Standards/Products Standard (NBS/PS):

1. PS1 - Construction and Industrial Plywood.

M. Americans with Disability Act (ADA)

1. ADA - Standards for Accessible Design.

1.3 MANUFACTURER'S SYSTEM ENGINEERING DESCRIPTION

A. Structural Performance: Engineer, fabricate and install telescopic gym seating systems to the following structural loads without exceeding allowable design working stresses of materials involved, including anchors and connections. Apply each load to produce maximum stress in each respective component of each gym seat unit.

1. Design Loads: Comply with ICC 300 – 2012 Edition.

B. Manufacturer's System Design Criteria:

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1. Gymnasium seat assembly; Design to support and resist, in addition to it's own weight, the following forces:
    a. Live load of 120 lbs per linear foot [162.69 N/m] on seats and decking
    b. Uniformly distributed live load of not less than 100 lbs per sq. ft. [135.58N/m] of gross horizontal projection.
    c. Parallel sway load of 24 lbs. [32.53 N/m] per linear foot of row combined with (b.) above
    d. Perpendicular sway load of 10 lbs. [13.56 N-m] per linear foot of row combined with (b.) above
2. Hand Railings, Posts and Supports: Engineered to withstand the following forces applied separately:
    a. Concentrated load of 200 lbs. [90.72 kg] applied at any point and in any direction.
    b. Uniform load of 50 lbs. per foot [.344 N/mm^2] applied in any direction.
3. Guard Railings, Post and Supports: Engineered to withstand the following forces applied separately:
    a. Concentrated load of 200 lbs. [90.72 kg] applied at any point and in any direction along top rail.
    b. Uniform load of 50 lbs. per foot [.344 N/mm^2] applied horizontally at top rail and a simultaneous uniform load of 100 lbs. per foot [.689 N/mm^2] applied vertically downward.
4. Member Sizes and Connections: Design criteria (current edition) of the following shall be the basis for calculation of member sizes and connections:
    a. AISC: Manual of Steel Construction
    b. AISI: Specification for Design of Cold Formed Steel Structural Members
    c. AA: Specification for Aluminum Structures
    d. NFOPA: National Design Guide For Wood Construction.

1.4 SUBMITTALS

A. Section Cross-Reference: Required submittals in accordance with "Conditions of the Contract" and Division 1 General Requirements sections of this "Project Manual."

B. Project Data: Manufacturer's product data for each system. Include the following:
    1. Project list: Ten (10) seating projects of similar size, complexity and in service for at least five (5) years.
    2. Deviations: List of deviations from these project specifications, if any.

C. Shop Drawings: Indicate Telescoping Gym Seat assembly layout. Show seat heights, row spacing and rise, aisle widths and locations, assembly dimensions, anchorage to supporting structure, material types and finishes.
    1. Wiring Diagrams: Indicate electrical wiring and connections.
    2. Graphics Layout Drawings: Indicate pattern of contrasting or matching seat colors

D. Samples: Seat materials and color finish as selected by Architect from manufacturers offered color finishes.

E. Manufacturer Qualifications: Certification of insurance coverage and manufacturing experience of manufacturer, and copy of a telescopic load test to all loads described in 1.03 above, observed by a qualified independent testing laboratory, and certified by a registered professional structural engineer verifying the integrity of the manufacturer's geometry design and base structural assumptions.

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F. Installer Qualifications: Installer qualifications indicating capability, experience, and official Certification Card issued by manufacturer of telescopic seating.

G. Engineer Qualifications: Certification by a professional engineer registered in the state of manufacturer that the equipment to be supplied meets or exceeds the design criteria of this specification.

H. Operating/Maintenance Manuals: Provide to Owner maintenance manuals. Demonstrate operating procedures, recommended maintenance and inspection program.

I. Warranty: Manufacturers standard warranty documents.

J. UL List Certificate for Complete Power System.

1.5 QUALITY ASSURANCE

A. Seating Layout: Comply with current Indiana Building Code.

B. Welding Standards & Qualification: Comply with AWS D1.1 Structural Welding Code - Steel and AWS D1.3 Structural Welding Code - Sheet Steel.

C. Insurance Qualifications: Mandatory that each bidder submit with his bid an insurance certificate from the manufacturer evidencing the following insurance coverage:

1. Workers Compensation - including Employers Liability with the following limits:

$500,000.00 (US) Each Accident
$500,000.00 (US) Disease - Policy Limit
$500,000.00 (US) Disease - Each Employee

2. Commercial General Liability - including premises/ operations, independent contractors and products completed operations liability. Limits of liability shall not be less than $5,000,000.00 (US).

D. Manufacturer Qualifications: Manufacturer who has a minimum of 40 years of experience manufacturing telescoping gym seats and can demonstrate continual design enhancement and 25-year minimum product life-cycle support of telescopic seating.

E. Installer Qualifications: Engage experienced Installer who has specialized in installation of telescoping gym seat types similar to types required for this project and who carries an official Certification Card issued by telescoping gym seat manufacturer.

F. Engineer Qualifications: Engage licensed professional engineer experienced in providing engineering services of the kind indicated that have resulted in the successful installation of telescoping bleachers similar in material, design, fabrication, and extent to those types indicated for this project.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver telescopic gym seats in manufacturers packaging clearly labeled with manufacturer name and content.

B. Handle seating equipment in a manner to prevent damage.

C. Deliver the seating at a scheduled time for installation that will not interfere with other trades operating in the building.

1.7 PROJECT CONDITIONS

A. Field Measurements: Coordinate actual dimensions of construction affecting telescoping bleachers installation by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.

1.8 WARRANTY

A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for telescoping bleachers. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.

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1. Warranty Period: Ten years from Date of Acceptance.
2. Beneficiary: Issue warranty in legal name of project Owner.
3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty documents.

1.9 MAINTENANCE AND OPERATION

A. Instructions: Both operation and maintenance shall be transmitted to the Owner by the manufacturer of the seating or his representative.

B. Service: Maintenance and operation of the seating system shall be the responsibility of the Owner or his duly authorized representative, and shall include the following:

1. Operation of the Seating System shall be supervised by responsible personnel who will assure that the operation is in accordance with the manufacturer's instructions.
2. Only attachments specifically approved by the manufacturer for the specific installation shall be attached to the seating.
3. An annual inspection and required maintenance of each seating system shall be performed to assure safe conditions. At least biannually the inspection shall be performed by a professional engineer or factory qualified service personnel.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Hussey Seating Company, U.S.A.

1. Address: North Berwick, Maine, 03906
2. Telephone: (207) 676-2271; Fax: (207) 676-9690
3. Product: MAXAM Telescopic Gym Seat System by Hussey Seating Company
   a. Model: MAXAM26 Series Telescopic Gym Seats, adjustable row spacing in two inch increments from 22 inches [559] to 26 inches [660].
   b. MAXAM26 Series Telescopic Gym Seats, Select Rise Spacing: 9 5/8" [244]
   c. Aisle Type: Foot level aisles, hinged front steps, intermediate aisle steps.
   d. Seat Type: **SELECT:** Classic (wood seat), 10" Courtside Collection Plastic Seats.
      1) Seat color finish: manufacturers 15 standard colors for Courtside Collection
   e. Rail Type: Self-storing end rail, auto-rotating aisle hand rails.
      1) Rail color finish: Standard black or optional 15 standard colors to match Courtside Collection seat.
   f. Operation: electrical power
      1) Electrical Power System: Integral power with pendant control, audible alarm, limit switches
4. Product Description/Criteria:
   a. Bank Length: 81'-6"
   b. Aisle Widths: 2 @ 3'-0", 2 @ 4'-6"
   c. Number of Tiers: 13
   d. Row Spacing(s): 24"
   e. Row Rise: 9-5/8"
   f. Open Dimension: 26'-2 5/16"
   g. Closed Dimension: 5'-9"
   h. Overall Unit Height: 11'-0 3/8"
   i. Net Capacity: 562 per seat (18″ [457] for MAXAM)

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5. Special Applications: rear wall column cutouts.
6. Handicap Seating Provisions: Provide first tier modular recoverable Flex-rows per requirements of (ADA) Americans with Disability Act located as indicated.

2.2 MATERIALS

A. Lumber: ANSI/Voluntary Product 20, B & B Southern Pine

B. Plywood: ANSI/Voluntary Product PS1, APA A-C Exterior Grade.

C. Structural Steel Shapes, Plates and Bars: ASTM A 36.

D. Uncoated Steel Strip (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip.

E. Uncoated Steel Strip (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip.

F. Uncoated Steel Strip (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip.

G. Galvanized Steel Strip: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality.

H. Structural Tubing: ASTM A500 Grade B, cold-formed.

I. Polyethylene Polymer: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

J. Fasteners: Vibration-proof, of size and material standard with manufacturer.

2.3 UNDERSTRUCTURE FABRICATION

A. Frame System:

1. Wheels: Not less than 5" [127] diameter by 1 1/4" [32] with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil-impregnated bushings to fit 3/8" [10] diameter axles secured with E-type snap rings.
2. Lower Track: Continuous Positive Interglide System interlocks each adjacent CPI unit using an integral, continuous, anti-drift feature and through-bolted guide at front to prevent separation and misalignment. CPI units at end sections of powered banks and manual sections shall contain a Low Profile Posi-Lock LX to lock each row in open position and allow unlocking automatically. Provide adjustable stops to allow field adjustment of row spacings. Interlock to have 10” of continuous engagement.
3. Slant Columns: High tensile steel, tubular shape.
4. Sway Bracing: High tensile steel members through-bolted to columns.
5. Deck Stabilizer: High tensile steel member through-bolted to nose and riser at three locations per section. Interlocks with adjacent stabilizer on upper tier using low-friction nylon roller to prevent separation and misalignment. Incorporates multiple stops to allow field adjustment of row spacings.
6. Mid and higher rise (11-5/8”, 14”, and 16”) deck supports/stabilizers must be of a one piece design made specifically for the rise. Use of additional bolted on straps or other methods to extend the height of the support is not acceptable.
7. Deck Support: Securely captures front and rear edge of decking at rear edge of nose beam and lower edge of riser beam for entire length of section.
8. Bleacher manufacturer to perform destructive welding testing on each shift to assure welding is done correctly. This is to be done with random samples of bleacher frame assemblies and deck supports.

B. Deck System:

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1. Section Lengths: Each bank shall contain sections not to exceed 27'-0" [7772] in length with a minimum of two supporting frames per row, each section.
2. Nose beam and Rear Riser beam: Nose beam shall be continuously roll-formed closed tubular shape of ASTM A653 grade 40, Riser beam shall be continuously roll-formed of ASTM A653 grade 40. Nose and Riser beam shall be designed with no steel edges exposed to spectator after product assembly.
3. Attachment: Through-Bolted fore/aft to deck stabilizers, and frame cantilevers.
4. Decking: 5/8" [16], AC grade clear-top-coated tongue and groove Southern Yellow Pine of interior type with exterior glue, 5-ply, all plies with plugged crossbands, produced in accordance with National Bureau of Standards PS-1-97. Plywood shall be cut and installed with top, center and bottom ply grain-oriented from front of deck to rear of deck (nose beam to riser beam). Adjacent pieces shall be locked together with tongue and groove joint from front to rear of deck. Longest unsupported span: MAXAM 26, 21 ½" [546];
5. Deck End Overhang: Not to exceed frame support by more than 5'-11" [1702].

2.4 SEATING FABRICATION

A. Classic Wood Seat System:

1. Seats and Front Riser: 4/4" nominal thickness kiln dried, end finger joined only and/or solid Southern Pine Grade "B & B" in conformity with the Southern Pine Inspection Bureau (SPIB) Grading Rules. Mixed lumber species, edge glued strips, or plugs are unacceptable.
2. Seats: Bench seat posture pitched to the rear for spectator comfort. Seats and front risers shall have full-radiused comfort shaped edges.
3. Seat Supports: Seat supports shall be through-bolted to seats, front risers, and noses and shall be provided in sufficient number to limit unsupported length of bench seat to 3'-0" [914].

B. Plastic Seat System – Courtside Collection XC10 (10"):

1. Hussey Courtside Collection Series embodies the latest leading edge innovations in linear telescopic seating modules. Courtside seats utilize a harmonious blend of advanced ergonomic principals, architecturally appealing design, safety, value and performance.
2. Seat Modules: 18" [457] long assembled, gas assisted injection-molded, high density, 100% recyclable HDPE (high density polyethylene) modules in monochromatic colors providing, dual textured scuff resistant 10" [254] or 12" [305] wide seat surface with ½" [13] minimum interlock on seat and face. Unit structural tested to 600 lbs occupant load.
   a. Courtside XC10 Seat Module
      1) XC10 – 10" Comfort Profile
         a) 10" wide continuous comfort curve style bench seat
         b) Ergonomically contoured forward "waterfall" edge for enhanced spectator comfort and minimization of sensitive pressure point area, regardless of leg positioning.
         c) Fore & Aft contoured seat surface for uniform support and minimize high pressure points under the buttocks.
         d) Seat height ranges from deck to t/o seat range from 16-1/8" to 18-1/8"
         e) 21-1/8" clear foot space area, regardless of leg positioning.
      2) Integrally molded end caps at aisle end locations for clean finished appearance.
      3) Integrally molded rear closure panel at back of seat to allow for "continuous clean sweep" of debris at deck level and minimized visibility of structural ribbing.

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4) Seat Attachment: Each plastic seat module shall be securely anchored by a 12 ga steel clamp bracket that provides a steel-to-steel, through bolted attachment to the front nose beam of the bleacher. Attachment eliminates fore / aft movement of the seat module on the nose beam.

2.5 SHOP FINISHES

A. Understructure: For rust resistance, steel understructure shall be finished on all surfaces with black "Dura-Coat" enamel. Understructure finish shall contain a silicone additive to improve scratch resistance of finish.

B. Wear Surfaces: Surface subject to normal wear by spectators shall have a finish that does not wear to show different color underneath:

1. Steel nosing and rear risers shall be pre-galvanized with a minimum spangle of G-60 zinc plating.
2. Decking shall have use-surfaces to receive both a sealer coat and wear-resistant high gloss clear urethane finish.
3. Classic wood seats and fascia shall be triple sanded and receive a sealer coat with use surfaces to receive high gloss clear urethane finish.
4. Injection Molded CourtSide to be selected from (15) fifteen standard colors. Colors shall be per manufacturer's standards

C. Railings: Steel railings shall be finished with powder-coated semi - gloss black or optional 15 standard colors to match plastic seat color.

2.6 FASTENINGS:

A. Welds: Performed by welders certified by AWS standards for the process employed.

B. Structural Connections: Secured by structural bolts with prevailing torque lock nuts, free-spinning nuts in combination with lock washers, or Riv-nuts in combination with lock washers.

2.7 ELECTRICAL OPERATION

A. Integral Power

1. Default operation shall be with a removable pendant control unit which plugs into seating bank for tethered operator management of stop, start, forward, and reverse control of the power operation. Other modes of operation are optional.
2. PF1/2/3/4**:** Furnish and install Hussey PF(1/2/3/4), an integral automatic electro mechanical powered frame propulsion system, to open and close telescopic seating.
   a. Electrical - Seating Manufacturer shall provide all wiring within seating bank, including pendant control. Motors, housing, and wiring shall be installed and grounded in complete accord with the National Electrical Code. The electrical contractor shall perform all connections at and upstream of the equipment specified herein, and ensure that supplied voltage drops no more than 4% below nominal where power connects there to. If wireless seating is desired, to prevent 3rd party control of the system, power is made available to the Remote Control Receiver for a limited time by a Radio Frequency Identification (RFID) system that requires activation by the operator. Once the power system is activated, an audio beep and visual light is active to notify the user that the system is energized and ready for operation. The wireless remote shall be used by trained authorized operators to open and close the system with continuous pressure applied to the desired button. A hard wired back up pendant shall be provided in case the wireless remote is lost or damaged.
   b. Each unit for PF(1/2/3/4) is driven by a 1/2 horsepower, 1725 RPM motor.

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1) 208V 3 Phase:
    a) This 1.25 Service Factor motor runs on 208V at 60 Hz and draws a full load current of 2.2 amperes. The required power supply shall be 3 asynchronous phases of 120 Volts each, plus neutral plus ground, each with 20 Amp capacity.
    b) This system shall be UL Listed in its entirety (motors, circuit protection, motor controls, user interface, enclosures, conductors and connectors all evaluated and approved for correct sizing and compatibility under maximum rated load on the motors) under UL Product Category FHJU, titled Electrical Drive and Controls for Folding and Telescopic Seating.
    c) Certificate for UL Listing must be submitted for this complete system.
    d) Use of UL Listed parts only is not acceptable.
2) Each pair of Powered Frames shall consist of output shaft gear reducer with 6" [152] diameter x 4" [102] wide wheels covered with non marring 1/2" [13] thick composite rubber, and operate the bleacher as follows:
    a) PF1 – Pulls at 46 feet / min [16.8 meters / min] with ½ Hp through 60:1 speed reduction to 2 drive wheels. Max pull approx 261 lbs [1161 N];
    b) PF2 – Pulls at 46 feet / min [16.8 meters / min] with ½ Hp through 60:1 speed reduction to 4 drive wheels. Max pull approx 261 lbs [1161 N];
    c) PF3 – Pulls at 25 feet / min [9.3 meters / min] with ½ Hp through 111:1 speed reduction to 4 drive wheels. Max pull approx 478 lbs [2126 N];
    d) PF4 – Pulls at 25 feet / min [9.3 meters / min] with 1 Hp through 111:1 speed reduction to 4 drive wheels. Max pull approx 956 lbs [4253 N];

3. Options
    a. Plug & Play Power
        1) The Plug & Play option enables safe cord and plug connection of the power system to the power supply, eliminates the need for a separate disconnect, and eliminates lockout tagout procedures at the bleacher. Electrical contractor shall provide and install the disconnect-rated receptacle and associated parts specified by the manufacturer. Manufacturer shall specify facility preparations for, and furnish and install a cord-and-plug connected power system. This option is available only with 208V 3 Phase.
    b. Limit Switches
        1) Limit switches will automatically stop integral power operation when seating has reached the fully extended or closed position. Manufacturer shall furnish and install both open and closed limit switches for the integral power system. Power operation shall utilize a combination of contactors and limit switches to insure the wiring is not energized except during operation. Straight wired electric system is not allowed.
4. For enhanced safety when the seating system is in operation, an audio alert will sound to notify the operator and other patrons that the seating system is in motion.
5. Each Powered Frame unit shall consist of output shaft gear reducer with 6" [152] diameter x 4" [102] wide wheels covered with non-marring 1/2" [13] thick composite rubber. Reducers shall be fitted with single phase induction motors which will provide an average operating speed of 25 f.p.m [12 M/s].
6. Front skirt panel shall be hinged for front access at all motor locations.
7. Operating Loads: Each Powered Frame provides 280 lbs pull force [1245N] which equals approximately (30) psi [.206 N/mm^2] lateral force on the floor.

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8. Limit Switches: Furnish and install both open and closed limit switches for the integral power system. The limit switches will automatically stop integral power operation when seating has reached the fully extended or closed position.
    a. Power operation shall utilize a combination of contactors and limit switches to insure the wiring is not energized except during operation. Straight wired electric system is not allowed.
9. Electrical: Seating Manufacturer shall provide all wiring within seating bank including pendant control.
    a. Each unit for PF(1/2/3/4) is power operated by a 1/2 horsepower, 1725 R.P.M., 208 Volts, 50/60 Hz., three phase 1.25 service factor motor. This motor draws a full load current of 2.2 amperes. Power supply required shall be 120/208 volts three phase 5 wire plus ground service with 20 amps. Motors, housing, and wiring shall be installed and grounded in complete accord with the National Electrical Code.
    b. The electrical contractor shall provide required power source with no greater than 4% voltage drop at the seatings' junction box. The electrical contractor shall perform all wiring connections in junction box that are attached to or a part of the building.
    c. The electrical contractor shall provide required 12 x 12 x 6 junction box and non-fused manual disconnect at each bank of bleachers.

2.8 ACCESSORIES

A. Flex-Row: Provide first row modular recoverable seating units to be utilized by persons in wheelchairs and able-bodied persons. Each Flex-Row unit shall have an unlock handle for easy deployment if wheelchair or team seating access is needed. Unlock handle shall lock the bleacher seats into position when fully opened.

1. Provide a black full-surround steel skirting with no more than ¾" floor clearance for safety and improved aesthetics.
2. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics.
3. Provide a mechanical positive lock when the Flex-Row system is in the open and used position.
4. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 to 7 seats wide as well as full section widths.
5. Provide Flex-Row Modules per drawings.

B. Front Aisle Steps: Provide at each vertical aisle location front aisle step. Front steps shall be hinged to the front row to prevent accidental separation or movement. Steps shall be fitted with wheels as a precautionary measure in case they are not flipped up and will allow them to roll in and out with the bleacher. Blow molded end caps shall have full radius on all four edges.

C. Non-Slip Tread: Provide at front edge of each aisle location an adhesive-backed abrasive non-slip tread surface.

D. Foot Level Aisles: Provide deck level full width vertical aisles located as indicated.

E. Intermediate Aisle Steps: Intermediate aisle steps shall be of boxed fully enclosed type construction. Blow molded end caps shall have full radius on all four edges. Step shall have adhesive-backed abrasive non-slip tread surface.

F. Intermediate Aisle Handrails: Provide single pedestal mount handrails 34" [864] high with terminating mid rail. Handrails shall be attached to the socket and shall automatically rotate 90° for storage in socket.

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G. Self Storing End Rails: Provide steel self-storing 42" [1066] high above seat, end rail with tubular supports and intermediate members designed with 4" [102] sphere passage requirements.

H. End Closure Curtains: Provide closure curtains fabricated of vinyl-coated 14oz Polyester fabric on open ends of telescopic seating. Curtains to be permanently attached to wall or rear closure panel and secured to individual rows of seating. Curtain to open with seating unit into taught secure configuration and fold automatically as seating unit closes.

I. Safety Accessories: Provide the following safety features:

1. Coin Round or Roll all edges of exposed metal on top and underneath Bleacher to eliminate sharp edges. Provide safety ease edges, coined edges, or rounded edges for the bleacher understructure components as follows. Diagonal or X braces and deck support or deck stabilizers. Systems provided with sharp edges or corners, to be rounded off in the field and field painted.
2. Provide plastic end cap on nose metal at Bank ends to close off edges to prevent spectator injury.
3. Provide plastic end cap on back of deck supports on 1st 7 Rows to prevent spectator injury.
4. On 1st Row, provide front and side skirt boards any where there is an exposed end to prevent players/balls from sliding underneath the 1st Row.
5. Provide metal cover over motor chains and wheels to protect chains from debris and provide a safety switch that if cover is taken off the power system will not work.
6. Provide metal end deck cover on each row to cover exposed edge of plywood at the ends of the bleachers.
7. Powered frames systems without a metal protective housing, covering drive chain and drive wheels are not permitted under this specification

J. Rear Wall Column Cutouts: Provide custom bleacher cutouts at rear wall building columns. Top row(s) to be cutout and scribe fitted to meet wall column conditions.

1. Colored Safety Rail Systems

a. Choose from 15 Standard colors
b. Durable powder coated finish.
c. Add color on to Center Aisle Handrails, Self Storing or Removable End Rails, Front Rails, or

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify area to receive telescoping gym seats are free of impediments interfering with installation and condition of installation substrates are acceptable to receive telescoping gym seats in accordance with telescoping gym seats manufacturer's recommendations. Do not commence installation until conditions are satisfactory.

3.2 INSTALLATION

A. Manufacturer's Recommendations: Comply with telescoping gym seats manufacturer's recommendations for product installation requirements.

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B. General: Manufacturer's Certified Installers to install telescoping gym seats in accordance with manufacturer's installation instructions and final shop drawings. Provide accessories, anchors, fasteners, inserts and other items for installation of telescoping gym seats and for permanent attachment to adjoining construction.

3.3 ADJUSTMENT AND CLEANING

A. Adjustment: After installation completion, test and adjust each telescoping gym seats assembly to operate in compliance with manufacturer's operations manual.

B. Cleaning: Clean installed telescoping gym seats on both exposed and semi-exposed surfaces. Touch-up finishes to restore damage or soiled surfaces.

3.4 PROTECTION

A. General: Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer to ensure telescoping gym seats are without damage or deterioration at time of substantial completion.

END OF SECTION

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SECTION 22 10 05 - PLUMBING PIPING

ADDENDUM 002

PART 1 GENERAL

2.1 SECTION INCLUDES

A. Sanitary waste piping, buried within 5 feet of building.
B. Sanitary waste and vent piping, above grade.
C. Domestic water piping, above grade.
D. Storm drainage piping, buried within 5 feet of building.
E. Storm drainage piping, above grade.
F. Pipe flanges, unions, and couplings.
G. Pipe hangers and supports.
H. Pipe sleeve-seal systems.
I. Balancing valves.
J. Strainers.

2.2 RELATED REQUIREMENTS

A. Section 08 31 00 - Access Doors and Panels.
B. Section 09 91 23 - Interior Painting.
C. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.
D. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
E. Section 22 07 19 - Plumbing Piping Insulation.
F. Section 31 23 16 - Excavation.
G. Section 31 23 23 - Fill.

2.3 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
C. ASME B31.9 - Building Services Piping.
D. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
E. ASTM B32 - Standard Specification for Solder Metal.
F. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
G. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric).
H. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.
I. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.
J. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
K. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
L. ASTM C1540 - Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.

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M. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

N. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

O. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

P. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.

Q. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.

R. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

S. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

T. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

U. AWWA C651 - Disinfecting Water Mains.

V. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

W. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

X. FM 1680 - Approval Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems Above and Below Ground, Industrial/ Commercial and Residential.

Y. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation.

Z. NSF 61 - Drinking Water System Components - Health Effects.

AA. NSF 372 - Drinking Water System Components - Lead Content.

BB. UL (DIR) - Online Certifications Directory.

CC. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

2.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, plastic piping primer and cements, and accessories. Provide manufacturers catalog information.

C. Sustainable Design Documentation: For products meeting regulatory lead-content restrictions.

D. Test Reports: Submit a copy of the final piping test reports approved by the Authority Having Jurisdiction to the Architect/ Engineer.

2.5 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.

B. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

2.6 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

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B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

2.7 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

3.1 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

3.2 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74 service weight.
   1. Fittings: Cast iron.
   2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies. (Shielded, Standard No-Hub Couplings.)

C. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

3.3 SANITARY WASTE AND VENT PIPING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A74, service weight.
   1. Fittings: Cast iron.
   2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies. (Shielded, Standard No-Hub Couplings.)

C. PVC Pipe: ASTM D1785 Schedule 40, or ASTM D2241 SDR 26 with not less than 150 psi pressure rating.
   1. Fittings: ASTM D2466, PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

3.4 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Pipe: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: ASTM B32, alloy Sn95 solder.
   3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.
      a. Manufacturers:
         1) SCI Press; an ASC Engineered Solutions brand
         2) Aalberts integrated piping systems; Apollo Press.
         3) Mueller Streamline Co.
         4) Nibco.
         5) Viega LLC.

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3.5 STORM DRAINAGE PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74 service weight.
   1. Fittings: Cast iron.
   2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: Shielded, Heavy Duty No-Hub Couplings.

C. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

3.6 STORM DRAINAGE PIPING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A74 service weight.
   1. Fittings: Cast iron.
   2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies. (Shielded, Heavy Duty No-Hub Couplings.)

3.7 PIPE FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 inch and Under:
   1. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

B. Flanges for Pipe Sizes Over 1 inch:
   1. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. No-Hub Couplings:
   1. Testing: In accordance with ASTM C1277 and CISPI 310.
   2. Gasket Material: Neoprene complying with ASTM C564.
   3. Band Material: Stainless steel.
   4. Eyelet Material: Stainless steel.
   5. Manufacturers:
      a. Anaco.
      b. Charlotte Pipe and Foundry Company.
      c. Fernco, Inc.
      d. MIFAB, Inc.
      e. Mission Rubber Company LLC.
      f. Tyler Pipe & Coupling.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

D. Shielded, Heavy Duty No-Hub Couplings:
   1. Testing: In accordance with ASTM C1540 and FM 1680.
   2. Gasket Material: Neoprene complying with ASTM C564.
   3. Band Material: Stainless steel.
   4. Eyelet Material: Stainless steel.
   5. Manufacturers:
      a. Anaco.
      b. Charlotte Pipe and Foundry Company.
      c. Fernco, Inc.
      d. MIFAB, Inc.
      e. Mission Rubber Company LLC.
      f. Tyler Pipe & Coupling.
      g. MIFAB, Inc.

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h. Substitutions: See Section 01 60 00 - Product Requirements.

E. Dielectric Connections: Union or nipple with galvanized or plated steel threaded end, copper solder end, grooved end, water impervious isolation barrier.

3.8 PIPE HANGERS AND SUPPORTS

A. See Section 22 05 29 for additional requirements.

B. Provide hangers and supports that comply with MSS SP-58.
1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
3. Trapeze Hangers: Welded steel channel frames attached to structure.
4. Vertical Pipe Support: Steel riser clamp.
5. Floor Supports: Steel pedestal with base stand and adjustable pipe saddle support.

C. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
3. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
4. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

D. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
4. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and steel support.
5. Floor Support for Hot Pipe Sizes to 4 inch: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and steel support.
6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

E. Hanger Fasteners: Attach hangers to structure using appropriate fasteners: See Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

F. Sway Bracing: Attach to structure. See Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

G. Pipe Joint Restraints: Attach to piping. See Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

3.9 PIPE SLEEVE-SEAL SYSTEMS

A. Manufacturers:
1. Advance Products & Systems, LLC.
2. Flexicraft Industries.
3. Garlock, an Enpro Inc. Co.
4. The Metraflex Company
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Modular Mechanical Seals:
1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
3. Size and select seal component materials in accordance to service requirements.
4. Service Requirements:
a. Corrosion resistant.
b. Underground, buried, and wet conditions.

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c. Fire Resistant: 1 hour, UL (DIR) approved.
d. High Temperature, up to 250 deg F.
e. Low temperature, down to minus 67 deg F.

5. Glass reinforced plastic pressure end plates.
6. Type 316 stainless steel bolts and nuts.

C. Wall Sleeve: Steel material with water-stop collar, and nailer end-caps.

3.10 BALANCING VALVES

A. Manufacturers:
1. Bell & Gossett; a xylem brand.
2. WATTS.
3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Manually operated ball type, triple purpose balancing valve, Size 1/2 to 3 inch:
1. Class 125 brass or bronze lead free body, stainless steel ball, glass and carbon filled seat rings, EPDM stem O-ring, calibrated nameplate and memory stop indicator, dual capped brass read out valves with internal check valves, tapped and plugged drain port, 400 psi working pressure, minus 4 to 250 deg F, threaded or soldered connections, standard and restricted flow.

C. Calibration: Control flow within five percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure 3.5 psi.

3.11 STRAINERS

A. Manufacturers:
1. Armstrong International, Inc.
2. Febco; a WATTS brand.
3. Green Country Filter Manufacturing.
4. Mueller Steam Specialty; a WATTS brand.
5. WATTS.
6. WEAMCO.
7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Size 1/2 inch to 3 inch:
1. Class 150, threaded or soldered forged bronze Y-pattern body, stainless steel perforated mesh screen with cap, and rated for 150 psi, 250 deg F WOG service.

C. Size 2 inch and Smaller:
1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

D. Size 1-1/2 inch to 4 inch:
1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

E. Size 5 inch and Larger:
1. Class 125, flanged iron body, basket pattern with 1/8 inch stainless steel perforated screen.

PART 3 EXECUTION

4.1 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

4.2 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.

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C. Prepare piping connections to equipment with flanges or unions.

4.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
   1. See Section 22 07 19.

G. Provide access where valves and fittings are not exposed.
   1. Coordinate size and location of access doors with Section 08 31 00.

H. Establish elevations of buried piping outside the building to ensure not less than 4 ft of cover.

I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.

J. Provide support for utility meters in accordance with requirements of utility companies.

K. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
   1. See Section 09 91 23 for painting of interior plumbing systems and components.

L. Excavate in accordance with Section 31 23 16.

M. Backfill in accordance with Section 31 23 23.

N. Install bell and spigot pipe with bell end upstream.

O. Install valves with stems upright or horizontal, not inverted. See Section 22 05 23.

P. Install water piping to ASME B31.9.

Q. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

R. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

S. Sleeve pipes passing through partitions, walls, and floors.

T. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as indicated.
   3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   4. Place hangers within 12 inches of each horizontal elbow.
   5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
   7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   8. Provide copper plated hangers and supports for copper piping.
   9. Support cast iron drainage piping at every joint.
   10. Furnish and Install sway bracing and pipe joint restraints for drain piping 4 inch and larger as required by the Plumbing Code.

U. Pipe Sleeve-Seal Systems:

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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 watertight seal.
6. Install in accordance with manufacturer's recommendations.

V. 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.

4.4 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

D. Provide flow controls in water recirculating systems where indicated.

4.5 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

4.6 FIELD TESTS AND INSPECTIONS

A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.

B. Drainage and Vent Systems:
1. Test for defects and leaks in new piping.
2. Water Test:
   a. Pipe openings shall be closed tightly, except the highest opening, and fill with water to the point of overflow, but no less than 10 foot head of water.
   b. Hold pressure for no less than 15 minutes.
   c. Inspect all joints for leaks.
   d. Finished Plumbing Test: After plumbing fixtures have been set and traps filled with water, test connections and prove they are watertight and gas tight.

C. Domestic Water Systems:
1. Perform hydrostatic testing for leakage prior to system disinfection.
2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
3. General:
   a. Fill the system with water and raise static head to 10 psi above service pressure. Minimum static head of 50 to 150 psi. As an exception, certain codes allow a maximum static pressure of 80 psi.

D. Test Results: Document and certify successful results, otherwise repair, document, and retest.

4.7 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfection of domestic water piping shall be done as prescribed by the Authorities having Jurisdiction. If Authorities having Jurisdiction do not have prescribed methods, comply with AWWA C651 or as described below:
1. Prior to starting work, verify system is complete, flushed, and clean.
2. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

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3. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
4. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
5. Maintain disinfectant in system for 24 hours.
6. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
7. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
8. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

4.8 SCHEDULES

A. Pipe Hanger Spacing:
1. Cast Iron Drain and Vent Piping:
   a. Pipe Size: 1 1/2 inch to 2 inch:
      1) Maximum Hanger Spacing: 5 ft.
      2) Hanger Rod Diameter: 3/8 inches.
   b. Pipe Size: 3 inch:
      1) Maximum Hanger Spacing: 5 ft.
      2) Hanger Rod Diameter: 1/2 inches.
   c. Pipe Size: 4 inch and 5 inch:
      1) Maximum Hanger Spacing: 5 ft.
      2) Hanger Rod Diameter: 5/8 inches.
   d. Pipe Size: 6 inch and 8 inch:
      1) Maximum Hanger Spacing: 5 ft.
      2) Hanger Rod Diameter: 3/4 inches.
   e. Pipe Size: 10 inch and 12 inch:
      1) Maximum Hanger Spacing: 5 ft.
      2) Hanger Rod Diameter: 7/8 inches.
   f. Pipe Size for 10 foot pipe lengths: 1 1/2 inch to 12 inch:
      1) Maximum Hanger Spacing: 10 ft.
      2) Hanger Rod Diameter: Refer to a through e above.
   g. Vertical Piping Size 1 1/2 inch to 12 inch:
      1) Base of piping, at each floor, and 15 ft maximum support spacing.
2. ABS and PVC Drain and Vent Piping:
   a. Pipe Size: 1 1/2 inch to 2 inch:
      1) Maximum Hanger Spacing: 4 ft.
      2) Hanger Rod Diameter: 3/8 inches.
   b. Pipe Size: 3 inch:
      1) Maximum Hanger Spacing: 4 ft.
      2) Hanger Rod Diameter: 1/2 inches.
   c. Pipe Size: 4 inch and 5 inch:
      1) Maximum Hanger Spacing: 4 ft.
      2) Hanger Rod Diameter: 5/8 inches.
   d. Pipe Size: 6 inch and 8 inch:
      1) Maximum Hanger Spacing: 4 ft.
      2) Hanger Rod Diameter: 3/4 inches.
   e. Pipe Size: 10 inch and 12 inch:
      1) Maximum Hanger Spacing: 4 ft.
      2) Hanger Rod Diameter: 7/8 inches.
   f. Vertical Piping Size 1 1/2 inch to 12 inch:
      1) Base of piping, at each floor, and 4 ft maximum support spacing.
3. Copper Domestic Water Piping:
   a. Pipe Size: 3/4 inch and smaller:

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1) Maximum Hanger Spacing: 5 ft.
2) Hanger Rod Diameter: 3/8 inches.

b. Pipe Size: 1 inch to 1 1/4 inch:
1) Maximum Hanger Spacing: 6 ft.
2) Hanger Rod Diameter: 3/8 inches.

c. Pipe Size: 1 1/2 inch to 2 inch:
1) Maximum Hanger Spacing: 8 ft.
2) Hanger Rod Diameter: 3/8 inches.

d. Pipe Size: 2 1/2 inch:
1) Maximum Hanger Spacing: 9 ft.
2) Hanger Rod Diameter: 1/2 inches.

e. Pipe Size: 3 inch:
1) Maximum Hanger Spacing: 10 ft.
2) Hanger Rod Diameter: 1/2 inches.

f. Pipe Size: 3 inch to 5 inch:
1) Maximum Hanger Spacing: 10 ft.
2) Hanger Rod Diameter: 1/2 inches.

g. Pipe Size: 6 inch:
1) Maximum Hanger Spacing: 10 ft.
2) Hanger Rod Diameter: 5/8 inches.

h. Pipe Size: 8 inch:
1) Maximum Hanger Spacing: 10 ft.
2) Hanger Rod Diameter: 3/4 inches.

i. Vertical Piping Size 1 1/2 inch to 8 inch:
1) Base of piping, at each floor, and 10 ft maximum support spacing.

END OF SECTION

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SECTION 23 09 23 - DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

(ADDENDUM 002)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. System description.
B. Operator interface.
C. Networks
D. Controllers.
E. Power supplies and line filtering.
F. System software.
G. Controller software.

1.2 RELATED REQUIREMENTS

A. Section 01 91 13 - General Commissioning Requirements
B. Section 01 91 14 - Commissioning Authority Responsibilities
C. Section 23 08 00 - Commissioning of HVAC
D. Section 23 09 13 - Instrumentation and Control Devices for HVAC.
E. Section 23 09 93 - Sequence of Operations for HVAC Controls.
F. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

A. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks.
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
C. CTA-709.1 - Control Network Protocol Specification.
D. IEEE 802.11 - IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems - Local and Metropolitan Area Networks--Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications.
E. MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests.
F. Modbus - The Modbus Organization Communications Protocol..
G. Modbus (PS) - The Modbus Organization Communications Protocol..
H. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
I. NFPA 70 - National Electrical Code.
J. UL (DIR) - Online Certifications Directory.

1.4 PRE-INSTALLATION MEETING

A. Conduct a pre-installation coordination conference before submitting on the Building Management System. Include at a minimum, the Construction Manager, owner's representative and the mechanical design engineer.
B. This meeting will assist all representatives in coordinating and refining the installation of the Building Management System. Include at a minimum the following items:
   1. Proposed control panel locations and approximate sizes.
   2. Understanding of who is providing and installing control related devices. i.e. factory provided controls, Variable Frequency Drives (VFD's), air flow stations, any additional flow devices, phase or power monitoring equipment and control dampers and actuators.

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3. Use of conduit and surface mounted raceway versus concealment in walls and ceiling areas.
4. Room temperature sensor types and proposed locations for each type. i.e. plate type, setpoint adjust, unoccupied override and any display type sensors.
   a. Understand plate-type sensor application in corridors, entrances, lobbies, gymnasium and cafeterias, auditoriums, and other public areas.
   b. Define setpoint adjust application (where owner prefers and engineer recommends), types and preferences for owner and/or BMS contractor.
   c. Define override button application, type and permitted operation.
5. CO2 and humidity sensor types, quantity, and placement.
6. Control sequence details and questions.
7. Proposed time schedules and building layout. How are areas grouped, how will override and occupancy sensors interact with system?
8. Describe control integration to lighting control system, boilers, chillers, VFD's, power monitoring, natural gas monitoring, snowmelt systems, generator, fire alarm system. How and what protocols.
9. Interface to owner's network, server type and who is providing.
10. Graphic screen examples and sequencing, navigation paths, point designation and display, point overrides, time schedule display and change procedures. Will the owner have ability to modify setpoints, parameters and graphic screens?
11. How local and remote access to graphics is accomplished. Phone, tablet, and computer interface descriptions.
12. Pre-commissioning control start-up procedures contractor plans to implement.
13. Describe understanding of interaction and cooperation with TAB and commissioning process.
14. Any additional clarification requested from BMS contractor, owner, design engineer or CM.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for each system component and software module.

C. Shop Drawings:
   1. Indicate trunk cable schematic showing programmable control unit locations, and trunk data conductors.
   2. List connected data points, including connected control unit and input device.
   3. Indicate system graphics indicating monitored systems, data (connected and calculated) point addresses, and operator notations.
   4. Show system configuration with peripheral devices, batteries, power supplies, diagrams, modems, and interconnections.
   5. Indicate description and sequence of operation of operating, user, and application software.

D. Manufacturer's Instructions: Indicate manufacturer's installation instructions for all manufactured components.

E. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors.
   1. Revise shop drawings to reflect actual installation and operating sequences.
   2. Include submittals data in final "Record Documents" form.

F. Operation and Maintenance Data:
   1. Include interconnection wiring diagrams complete field installed systems with identified and numbered, system components and devices.
   2. Include keyboard illustrations and step-by-step procedures indexed for each operator function.

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3. Include inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.

G. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner s name and registered with manufacturer.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with NFPA 70.

B. Designer Qualifications: Perform design of system using manufacturer's software under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

D. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

E. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for purpose specified and indicated.

1.7 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide five year manufacturer's warranty for field programmable micro-processor based units.

1.8 PROTECTION OF SOFTWARE RIGHTS

A. Prior to delivery of software, the Owner and the party providing the software will enter into a software license agreement with provisions for the following:
   1. Limiting use of software to equipment provided under these specifications.
   2. Limiting copying.
   3. Preserving confidentiality.
   4. Prohibiting transfer to a third party.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Automated Logic

B. Distech Controls

C. Honeywell International, Inc.

D. Johnson Controls, Inc.

E. Reliable Controls

F. Schneider Electric.

G. Siemens AG, Building Technologies Division.

H. Trane

I. Tridium / Niagara

2.2 SYSTEM DESCRIPTION

A. Automatic temperature control field monitoring and control system using field programmable micro-processor based units.

B. Base system on distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on token passing network, with central and remote hardware, software, and interconnecting wire and conduit.

C. Include computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices, actuators.

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D. Controls for terminal units, radiation, reheat coils, unit heaters, fan coils, and the like when directly connected to the control units.

E. Provide control systems consisting of sensors, thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems, and to perform functions specified.

F. Include installation, calibration, commissioning, supervision, adjustments, and fine tuning necessary for complete and fully operational system.

G. Any Vykon or name branded Jace or Supervisory package will be provided with:
   1. Open NiCS licensing including: the following components set to “ALL”: “accept.station.in=”, “accept.station.out=”, “accept.wb.in=” and “accept.wb.out=”
   2. A minimum of 3-year Software Maintenance Agreement (SMA) license.
   3. License for, at a minimum, 20% additional devices than are needed at time of installation.
   4. JACE and station PASS PHRASEs and administrative PASSWORDs provided to owner before substantial completion.
   5. Upgrade the supervisory package and each Jace to the most recent version of software at time of substantial completion of control system.

2.3 PERFORMANCE REQUIREMENTS

A. Surface-Burning: Products shall comply with ASTM E84.
   1. Flame-Spread: 25.
   2. Smoke-Developed: 50.

B. Network Bandwidth: DDC system shall be designed for a minimum of 30% spare bandwidth with DDC system operating at full capacity.

C. Data Storage:
   1. Provide local or cloud based storage capacity for a minimum of 36 consecutive months of system/trending data for 100% of all system points.

D. Expandablity:
   1. DDC system shall be expandable to double the total initial system capacity.including controllers and wiring bandwidth.
   2. Operator interface shall have sufficient capacity to accommodate the doubled capacity without any upgrades.

E. Accuracy:
   1. Airflow: +/-2%.
   2. Waterflow: +/-2%.
   3. Gas:
      a. Carbon Dioxide: +/-25 ppm.
      b. Carbon Monoxide: +/-5 ppm.
      c. Nitrogen DIoxide: +/-5 ppb.
      d. Refrigerant: +/-2.5%.
   4. Pressure: +/-1%.
   5. Temperature, Dry Bulb: +/- degrees F.
   6. Temperature, Wet Bulb: +/- 1 degrees F.
   7. Humidity: +/-2%.

F. Enclosure Requirements shall comply with the following NEMA 250 enclosure requirements:
   1. Outdoors: Type 4X.
   2. Indoors: Type 2.
   3. Mechanical Equipment Rooms: Type 4.
   4. Localized Areas Exposed to Washdown: Type 4X.
   5. Hazardous Locations: Explosion-proof rating for condition.

G. Backup Power Source:

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1. HVAC systems and equipment connected to backup power/generator shall have all associated controls and controllers supplied with backup power as well.

2.4 OPERATOR INTERFACE

A. DDC system shall be Web based. The web-based interface will provide real-time data visualization, control capabilities, and historical data analysis.
   1. Resides on high speed network with building controllers.
   2. Connected to server for full access to all system information.

B. Server, controllers, and control backbone to communicate using BACnet protocol and addressing.

C. Minimum Communication Protocols:
   1. BACnet protocol to comply with ASHRAE Std 135.
   2. LonTalk protocol to comply with CTA-709.1.
   3. Modbus TCP and RTU protocol.

D. Hardware:
   1. Server to be provide by owner.
   2. Wireless Routers
      a. Manufacturers:
         1) Cisco Linksys.
         2) D-Link Corporation/D-Link Systems, Inc.
         3) NETGEAR Inc.
      b. Description: High-speed, dual-band router with integral Ethernet ports and USB port.
      c. Technology: IEEE 802.11ax; 2.4- and 5-GHz speed bands.
      d. Minimum Speeds: 300 Mbps on 2.4-GHz band and 450 Mbps on 5-GHz band.
      e. Compatibility: IEEE 802.11n/g/b/a wireless devices.
      f. Ethernet Ports: Four, gigabit.
      g. USB Port: One, USB 2.0 or 3.0 and one, USB C.
      h. Wireless Security: Wi-Fi Protected Access (WPA2) and WPA3 according to IEEE 802.11i.
   3. Network Ports: For hardwired connection of portable workstation. Network port shall be accessible, protected, labeled, and installed at the following locations:
      a. Each mechanical equipment room.
      b. Security system front end.
      c. Fire-alarm system front end.

2.5 NETWORKS

A. Acceptable Communication Protocols:
   1. ASHRAE Std 135, BACnet
   2. Modbus/Modbus (PS)

B. Acceptable communication buses:
   1. RS-485 using MS/TP
   2. IP/Ethernet
   3. Twisted Pair
   4. Fiber Optic

2.6 CONTROLLERS

A. Building Controllers:
   1. General:
      a. Manage global strategies by one or more, independent, standalone, microprocessor based controllers.
      b. Provide sufficient memory to support controller's operating system, database, and programming requirements.
      c. Share data between networked controllers.

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d. Controller operating system manages input and output communication signals allowing distributed controllers to share real and virtual object information and allowing for central monitoring and alarms.
e. Utilize real-time clock for scheduling.
f. Continuously check processor status and memory circuits for abnormal operation.
g. Controller to assume predetermined failure mode and generate alarm notification upon detection of abnormal operation.
h. Communication with other network devices to be based on assigned protocol.

2. Communication:
   a. Controller to reside on a BACnet network using ISO 8802-3 (ETHERNET) Data Link/Physical layer protocol.
   b. Perform routing when connected to a network of custom application and application specific controllers.
   c. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
3. External Input-Output (I-O) Data Bus:
   a. Input only modules.
   b. Output only modules.
   c. Variable frequency drives (VFD's).
   d. Universal I-O module (configurable).
   e. Access control module for single door.
   f. Specific wired data integration modules.
   g. DALI (Digital addressable lighting interface) modules.
   h. Motor control of devices like blinds, roller shutters, and sun protection systems.
   i. Multiple Input Output (I-O) Module:
      1) IAQ: Temperature, humidity, and CO2.
      2) Audio: Microphone, tone generator, and speaker.
      3) Input and output terminals to monitor or control local devices.
      4) Occupancy: Light and thermal sensing with multi-colored LED feedback.
4. Anticipated Environmental Ambient Conditions:
   a. Outdoors and/or in Wet Ambient Conditions:
      1) Mount within waterproof enclosures.
      2) Rated for operation at 40 to 150 degrees F.
   b. Conditioned Space:
      1) Mount within dustproof enclosures.
      2) Rated for operation at 32 to 120 degrees F.
5. Provisions for Serviceability:
   a. Diagnostic LEDs for power, communication, and processor.
   b. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.
6. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
7. Power and Noise Immunity:
   a. Maintain operation at 90 to 110 percent of nominal voltage rating.
   b. Perform orderly shutdown below 80 percent of nominal voltage.
   c. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W. at 3 feet.

B. Custom Application Controller:
   1. General:
      a. Provide sufficient memory to support controller's operating system, database, and programming requirements.
      b. Share data between networked, microprocessor based controllers.

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c. Controller operating system manages input and output communication signals allowing distributed controllers to share real and virtual object information and allowing for central monitoring and alarms.
d. Utilize real-time clock for scheduling.
e. Continuously check processor status and memory circuits for abnormal operation.
f. Controller to assume predetermined failure mode and generate alarm notification upon detection of abnormal operation.
g. Communication with other network devices to be based on assigned protocol.

2. Communication:
   a. Controller to reside on a BACnet network using MS/TP Data Link/Physical layer protocol.
   b. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
3. Anticipated Environmental Ambient Conditions:
   a. Outdoors and/or in Wet Ambient Conditions:
      1) Mount within waterproof enclosures.
      2) Rated for operation at 40 to 150 degrees F.
   b. Conditioned Space:
      1) Mount within dustproof enclosures.
      2) Rated for operation at 32 to 120 degrees F.
4. Provisions for Serviceability:
   a. Diagnostic LED's for power, communication, and processor.
   b. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.
5. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
6. Power and Noise Immunity:
   a. Maintain operation at 90 to 110 percent of nominal voltage rating.
   b. Perform orderly shutdown below 80 percent of nominal voltage.
   c. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W. at 3 feet.

C. Application Specific Controllers:
1. General:
   a. Not fully user programmable, microprocessor based controllers dedicated to control specific equipment.
   b. Customized for operation within the confines of equipment served.
   c. Communication with other network devices to be based on assigned protocol.
2. Communication:
   a. Controller to reside on a BACnet network using MS/TP Data Link/Physical layer protocol.
   b. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
3. Anticipated Environmental Ambient Conditions:
   a. Outdoors and/or in Wet Ambient Conditions:
      1) Mount within waterproof enclosures.
      2) Rated for operation at 40 to 150 degrees F.
   b. Conditioned Space:
      1) Mount within dustproof enclosures.
      2) Rated for operation at 32 to 120 degrees F.
4. Provisions for Serviceability:
   a. Diagnostic LEDs for power, communication, and processor.
   b. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.

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5. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
6. Power and Noise Immunity:
   a. Maintain operation at 90 to 110 percent of nominal voltage rating.
   b. Perform orderly shutdown below 80 percent of nominal voltage.
   c. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3 feet.

D. Input/Output Interface:
1. Hardwired inputs and outputs tie into the DDC system through building, custom application, or application specific controllers.
2. All Input/Output Points:
   a. Protect controller from damage resulting from any point short-circuiting or grounding and from voltage up to 24 volts of any duration.
   b. Provide universal type for building and custom application controllers where input or output is software designated as either binary or analog type with appropriate properties.
3. Binary Inputs:
   a. Allow monitoring of On/Off signals from remote devices.
   b. Provide wetting current of 12 mA minimum, compatible with commonly available control devices and protected against the effects of contact bounce and noise.
   c. Sense dry contact closure with power provided only by the controller.
4. Pulse Accumulation Input Objects: Comply with all requirements of binary input objects and accept up to 10 pulses per second.
5. Analog Inputs:
   a. Allow for monitoring of low voltage 0 to 10 VDC, 4 to 20 mA current, or resistance signals (thermistor, RTD).
   b. Compatible with and field configurable to commonly available sensing devices.
6. Binary Outputs:
   a. Used for On/Off operation or a pulsed low-voltage signal for pulse width modulation control.
   b. Outputs provided with three position (On/Off/Auto) override switches.
   c. Status lights for building and custom application controllers to be selectable for normally open or normally closed operation.
7. Analog Outputs:
   a. Monitoring signal provides a 0 to 10 VDC or a 4 to 20 mA output signal for end device control.
   b. Provide status lights and two position (AUTO/MANUAL) switch for building and custom application controllers with manually adjustable potentiometer for manual override on building and custom application controllers.
   c. Drift to not exceed 0.4 percent of range per year.
8. Tri State Outputs:
   a. Coordinate two binary outputs to control three point, floating type, electronic actuators without feedback.
   b. Control algorithms run the zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.
9. System Object Capacity:
   a. System size to be expandable to twice the number of input output objects required by providing additional controllers, including associated devices and wiring.
   b. Hardware additions or software revisions for the installed operator interfaces are not to be required for future, system expansions.

2.7 POWER SUPPLIES AND LINE FILTERING

A. Power Supplies:

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1. Provide UL (DIR) listed control transformers with Class 2 current limiting type or over-current protection in both primary and secondary circuits for Class 2 service as required by the NEC.
2. Limit connected loads to 80 percent of rated capacity.
3. Match DC power supply to current output and voltage requirements.
4. Unit to be full wave rectifier type with output ripple of 5.0 mV maximum peak to peak.
5. Regulation to be 1 percent combined line and load with 100 microsecond response time for 50 percent load changes.
6. Provide over-voltage and over-current protection to withstand a 150 percent current overload for 3 seconds minimum without trip-out or failure.
7. Operational Ambient Conditions: 32 to 120 degrees F.
8. EM/RF meets FCC Class B and VDE 0871 for Class B and MIL-STD-810 for shock and vibration.
9. Line voltage units UL (DIR) recognized and CSA approved.

B. Power Line Filtering:
1. Provide external or internal transient voltage and surge suppression component for all servers and controllers.
2. Minimum surge protection attributes:
a. Dielectric strength of 1000 volts minimum.
b. Response time of 10 nanoseconds or less.
c. Transverse mode noise attenuation of 65 dB or greater.
d. Common mode noise attenuation of 150 dB or greater at 40 to 100 Hz.

2.8 LOCAL AREA NETWORK (LAN)

A. Provide communication between control units over local area network (LAN).

B. LAN Capacity: Not less than 60 stations or nodes.

C. Break in Communication Path: Alarm and automatically initiate LAN reconfiguration.

D. LAN Data Speed: Minimum 19.2 Kb.

E. Communication Techniques: Allow interface into network by multiple operation stations and by auto-answer/auto-dial modems. Support communication over telephone lines utilizing modems.

F. Transmission Median: Fiber optic or single pair of solid 24 gauge twisted, shielded copper cable.

G. Network Support: Time for global point to be received by any station, shall be less than 3 seconds. Provide automatic reconfiguration if any station is added or lost. If transmission cable is cut, reconfigure two sections with no disruption to system's operation, without operator intervention.

2.9 SYSTEM SOFTWARE

A. Operating System:
1. Concurrent, multi-tasking capability.
a. Common Software Applications Supported: Microsoft Excel and Word.
2. System Graphics:
a. Allow up to 10 graphic screens, simultaneously displayed for comparison and monitoring of system status.
b. Animation displayed by shifting image files based on object status.
c. Provide method for operator with password to perform the following:
1) Move between, change size, and change location of graphic displays.
2) Modify on-line.
3) Add, delete, or change dynamic objects consisting of:
(a) Analog and binary values.
(b) Dynamic text.
(c) Static text.

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(d) Animation files.

3. Custom Graphics Generation Package:
   a. Create, modify, and save graphic files and visio format graphics in PCX formats.
   b. HTML graphics to support web browser compatible formats.
   c. Capture or convert graphics from AutoCAD.
4. Standard HVAC Graphics Library:
   a. HVAC Equipment:
      1) Condensing Units
      2) Air Handlers.
      3) Fan Coil Units.
      4) Unit Ventilators.
   b. Ancillary Equipment:
      1) Fans.
      2) Pumps.
      3) Coils.
      4) Valves.
      5) Piping.
      6) Dampers.
      7) Ductwork.
   c. File Format Compatible with Graphics Generation Package Program.

B. Server System Applications:
1. Automatic System Database Save and Restore Functions:
   a. Current database copy of each Building Controller is automatically stored on hard disk.
   b. Automatic update occurs upon change in any system panel.
   c. In the event of database loss in any system panel, the server will automatically restores the database for that panel unless disabled by the operator.
2. Manual System Database Save and Restore Functions by Operator with Password Clearance:
   a. Save database from any system panel.
   b. Clear a panel database.
   c. Initiate a download of a specified database to any system panel.
3. Software provided allows system configuration and future changes or additions by operators under proper password protection.
4. On-line Help:
   a. Context-sensitive system assists operator in operation and editing.
   b. Available for all applications.
   c. Relevant screen data provided for particular screen display.
   d. Additional help available via hypertext.
5. Security:
   a. Operator log-on requires user name and password to view, edit, add, or delete data.
   b. System security selectable for each operator.
   c. System supervisor sets passwords and security levels for all other operators.
   d. Operator passwords to restrict functions accessible to viewing and/or changing system applications, editor, and object.
   e. Automatic, operator log-off results from keyboard or mouse inactivity during user-adjustable, time period.
   f. All system security data stored in encrypted format.
6. System Diagnostics:
   a. Operations Automatically Monitored:
      1) Workstations.
      2) Printers.

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3) Modems.
4) Network connections.
5) Building management panels.
6) Controllers.

b. Device failure is annunciated to the operator.

7. Alarm Processing:
   a. All system objects are configurable to "alarm in" and "alarm out" of normal state.
   b. Configurable Objects:
      1) Alarm limits.
      2) Alarm limit differentials.
      3) States.
      4) Reactions for each object.
8. Alarm Messages:
   a. Descriptor: English language.
   b. Recognizable Features:
      1) Source.
      2) Location.
      3) Nature.
9. Configurable Alarm Reactions by Workstation and Time of Day:
   a. Logging.
   b. Printing.
   c. Starting programs.
   d. Displaying messages.
   e. Dialing out to remote locations.
   f. Paging.
   g. Providing audible annunciation.
   h. Displaying specific system graphics.
10. Custom Trend Logs:
   a. Definable for any data object in the system including interval, start time, and stop time.
   b. Trend Data:
      1) Sampled and stored on the building controller panel.
      2) Archivable on hard disk.
      3) Retrievable for use in reports, spreadsheets and standard database programs.
      4) Archival on LAN accessible storage media including hard disk, tape, Raid array drive, and virtual cloud environment.
      5) Protected and encrypted format to prevent manipulation, or editing of historical data and event logs.
   c. The following is a minimum list of trends required to be logged:
      1) Air Handling Systems
         (a) Discharge Air Temperature and Setpoint
         (b) Space Temperature and Setpoint
         (c) Airflow and Setpoint
         (d) Outdoor Air Airflow
      2) Heating Plant
         (a) Equipment Operation Capacity
         (b) Boiler(s) Entering and Leaving Temperatures
         (c) Building Supply and Return Temperature and Setpoint(s)
      3) Space Conditions
         (a) Space Temperature and Setpoint
         (b) Space Humidity
         (c) Space Supply Air Temperature

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11. Alarm and Event Log:
    a. View all system alarms and change of states from any system location.
    b. Events listed chronologically.
    c. Operator with proper security acknowledges and clears alarms.
    d. Alarms not cleared by operator are archived to the server hard disk.
12. Object, Property Status and Control:
    a. Provide a method to view, edit if applicable, the status of any object and property in the system.
    b. Status Available by the Following Methods:
        1) Menu.
        2) Graphics.
        3) Custom Programs.
13. Reports and Logs:
    a. Reporting Package:
        1) Allows operator to select, modify, or create reports.
        2) Definable as to data content, format, interval, and date.
        3) Archivable to hard disk.
    b. Real-time logs available by type or status such as alarm, lockout, normal, etc.
    c. Stored on hard disk and readily accessible by standard software applications, including spreadsheets and word processing.
    d. Set to be printed on operator command or specific time(s).
14. Reports:
    a. Standard:
        1) Objects with current values.
        2) Current alarms not locked out.
        3) Disabled and overridden objects, points and SNVTs.
        4) Objects in manual or automatic alarm lockout.
        5) Objects in alarm lockout currently in alarm.
        6) Logs:
            (a) Alarm History.
            (b) System messages.
            (c) System events.
            (d) Trends.
    b. Custom:
        1) Daily.
        2) Weekly.
        3) Monthly.
        4) Annual.
        5) Time and date stamped.
        6) Title.
        7) Facility name.
    c. Tenant Override:
        1) Monthly report showing total, requested, after-hours HVAC and lighting services on a daily basis for each tenant.
        2) Annual report showing override usage on a monthly basis.
    d. Electrical, Fuel, and Weather:
        1) Electrical Meter(s):
            (a) Monthly showing daily electrical consumption and peak electrical demand with time and date stamp for each meter.
            (b) Annual summary showing monthly electrical consumption and peak demand with time and date stamp for each meter.
        2) Fuel Meter(s):

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(a) Monthly showing daily natural gas consumption for each meter.
(b) Annual summary showing monthly consumption for each meter.

3) Weather:
(a) Monthly showing minimum, maximum, average outdoor air temperature and heating/cooling degree-days for the month.

C. Server Applications Editors:
1. Provide editing software for each system application on server via web interface.
2. Downloaded application is executed at controller panel.
3. Full screen editor for each application allows operator to view and change:
a. Configuration.
b. Name.
c. Control parameters.
d. Set-points.
4. Scheduling:
a. Monthly calendar indicates schedules, holidays, and exceptions.
b. Allows several related objects to be scheduled and copied to other objects or dates.
c. Start and stop times adjustable from master schedule.
5. Custom Application Programming:
a. Create, modify, debug, edit, compile, and download custom application programming during operation and without disruption of all other system applications.
b. Programming Features:
1) English oriented language, based on BASIC, FORTRAN, C, or PASCAL syntax allowing for free form programming.
2) Alternative language graphically based using appropriate function blocks suitable for all required functions and amenable to customizing or compounding.
3) Insert, add, modify, and delete custom programming code that incorporates word processing features such as cut/paste and find/replace.
4) Allows the development of independently, executing, program modules designed to enable and disable other modules.
5) Debugging/simulation capability that displays intermediate values and/or results including syntax/execution error messages.
6) Support for conditional statements (IF/THEN/ELSE/ELSE-F) using compound Boolean (AND, OR, and NOT) and/or relations (EQUAL, LESS THAN, GREATER THAN, NOT EQUAL) comparisons.
7) Support for floating-point arithmetic utilizing plus, minus, divide, times, square root operators; including absolute value; minimum/maximum value from a list of values for mathematical functions.
8) Language consisting of resettable, predefined, variables representing time of day, day of the week, month of the year, date; and elapsed time in seconds, minutes, hours, and days where the variable values cab be used in IF/THEN comparisons, calculations, programming statement logic, etc.
9) Language having predefined variables representing status and results of the system software enables, disables, and changes the set points of the controller software.

2.10 CONTROLLER SOFTWARE

A. All applications reside and operate in the system controllers and editing of all applications occurs via web interface.

B. System Security:
1. User access secured via user passwords and user names.
2. Passwords restrict user to the objects, applications, and system functions as assigned by the system manager.
3. User Log On/Log Off attempts are recorded.

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4. Automatic Log Off occurs following the last keystroke after a user defined delay time.

C. Object or Object Group Scheduling:
   1. Weekly Schedules Based on Separate, Daily Schedules:
      a. Include start, stop, optimal stop, and night economizer.
      b. 10 events maximum per schedule.
      c. Start/stop times adjustable for each group object.
   2. Exception Schedules:
      a. Based on any day of the year.
      b. Defined up to one year in advance.
      c. Automatically discarded and replaced with standard schedule for that day of the week upon execution.
   3. Holiday or Special Schedules:
      a. Capability to define up to 99 schedules.
      b. Repeated annually.
      c. Length of each period is operator defined.

D. Provide standard application for equipment coordination and grouping based on function and location to be used for scheduling and other applications.

E. Alarms:
   1. Binary object is set to alarm based on the operator specified state.
   2. Analog object to have high/low alarm limits.
   3. All alarming is capable of being automatically and manually disabled.
   4. Alarm Reporting:
      a. Operator determines action to be taken for alarm event.
      b. Alarms to be routed to appropriate personnel via web interface.
      c. Reporting Options:
         1) Start programs.
         2) Print.
         3) Logged.
         4) Custom messaging.
         5) Graphical displays.

F. Demand Limiting:
   1. Building power consumption monitored from signals generated by a watt transducer, mounted at the building power meter.
   2. Demand limit controlled via load shedding or load restoration in a predetermined and predictive manner.
   3. Demand Reduction Methods:
      a. Space temperature set-point reset.
      b. Equipment off/on prioritization.
   4. Relevant variables that influence demand limiting control are based on the power company methodology for computing demand charges.
   5. Operator On-Line Changes Allowed:
      a. Addition and deletion of loads controlled.
      b. Changes in demand intervals.
      c. Changes in demand limit for meter(s).
      d. Maximum equipment shutoff time.
      e. Minimum equipment shutoff time.
      f. Select rotational or sequential shedding and restoring.
      g. Shed/restore priority.
   6. Information and Reports available Hourly, Daily, and Monthly:
      a. Total electric consumption.
      b. Peak demand.

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c. Date and time of peak demand.
d. Daily peak demand.

G. Maintenance Management: System monitors equipment status and generates maintenance messages based upon user-designated run-time limits.

H. Sequencing: Application software based upon specified sequences of operation in Section 23 09 93.

I. PID Control Characteristics:
1. Direct or reverse action.
2. Anti-windup.
3. Calculated, time-varying, analog value, positions an output or stages a series of outputs.
4. User selectable controlled variable, set-point, and PED gains.

J. Staggered Start Application:
1. Prevents all controlled equipment from simultaneously restarting after power outage.
2. Order of equipment startup is user selectable.

K. Energy Calculations:
1. Accumulated instantaneous power or flow rates are converted to energy use data.
2. Algorithm calculates a rolling average and allows window of time to be user specified in minute intervals.
3. Algorithm calculates a fixed window average with a digital input signal from a utility meter defining the start of the window period that in turn synchronizes the fixed-window average with that used by the power company.

L. Anti-Short Cycling:
1. All binary output objects protected from short-cycling.
2. Allows minimum on-time and off-time to be selected.

M. On-Off Control with Differential:
1. Algorithm allows binary output to be cycled based on a controlled variable and set-point.
2. Algorithm to be direct-acting or reverse-acting incorporating an adjustable differential.

N. Run-Time Totalization:
1. Totalize run-times for all binary input objects.
2. Provides operator with capability to assign high run-time alarm.

PART 3 EXECUTION

3.1 INSTALLERS

A. Installer List:
1. Control Logic of Michigan
2. Control Resources, Inc.
3. Control Solutions Inc.
4. ControlNET LLC
5. Enertemp
6. Grand Valley Automation.
7. Green Building Automation.
8. Johnson Controls, Inc. Corporate Office
9. KnightWatch
10. Siemens Building Technologies, Inc. Corporate Office
11. Smart Building Services
12. Trane Corporate Office

3.2 EXAMINATION

A. Verify existing conditions before starting work.

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B. Verify that conditioned power supply is available to the control units and to the operator work station. Verify that field end devices, wiring, and pneumatic tubing is installed prior to installation proceeding.

3.3 SYSTEM EQUIPMENT CONTROL

A. Equipment to be controlled shall include a minimum of the following:
   1. Hot water heating system and pumps
   2. Air handling systems and equipment
   3. Air-terminal units
   4. Air-handling units
   5. Computer-room air-conditioning units
   6. Fan-coil units
   7. Dehumidification units
   8. Refrigerant monitoring.

3.4 SYSTEM INTERFACE WITH OTHER SYSTEMS AND EQUIPMENT

A. Interface to equipment with integral/manufacturer installed controls.
   1. System shall have interface with equipment having integral controls and have an interface for remote monitoring or control and shall include custom graphics.
   2. Equipment with integral controls to be connected:
      a. Generators - BMS shall integrate the generator(s) provided by the electrical contractor. At a minimum BMS contractor shall provide generator status and any alarms.
      b. Automatic Transfer Switch - BMS shall integrate the ATS(s) provided by the electrical contractor. At a minimum BMS contractor shall provide:
         1) Voltage and amperage.
         2) Status and any alarms.
      c. Domestic water heater – BMS shall integrate the domestic water heater controller. At a minimum BMS shall provide:
         1) Water temperature and setpoint.
         2) Run status and firing rate.
         3) Diagnostic and alarm points.
      d. Packaged air-handling units – In addition to external control points per sequence of control and plans, BMS shall integrate the unit controller. At a minimum BMS contractor shall provide:
         1) Room temperature and setpoints.
         2) All unit control and monitoring points, settings, and parameters.
      e. Fan-coil and heat pump units – In addition to any external control and interlock points per sequence of control and plans, BMS shall integrate the unit controller. At a minimum BMS contractor shall provide:
         1) Room temperature and setpoints.
         2) All unit control and monitoring points, settings, and parameters.
      f. Computer-room air-conditioning units – In addition to any external control points per sequence of control and plans, BMS shall integrate the unit controller. At a minimum BMS contractor shall provide:
         1) Room temperature and setpoints.
         2) Room humidity and minimum and maximum setpoints.
         3) All unit control and monitoring points, settings, and parameters.
      g. Refrigerant, toxic, or combustible gas monitoring – In addition to any external control and interlock / safety points per sequence of control and plans, BMS shall integrate the unit controller. At a minimum BMS contractor shall provide monitored gas concentration levels, alarm level setpoints and any alarm conditions.

B. Interface to other systems:

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1. Systems to be connected:
   a. Networked Lighting Control System - BMS shall integrate with networked lighting control system provided by electrical contractor. Electrical contractor is responsible for providing all programming of lighting control system per specification and lighting control schedule. BMS contractor is responsible for naming, grouping, and organizing discovered lighting control points. Refer to electrical drawings for lighting control schedule, lighting zones, and scenes. At a minimum BMS contractor shall provide:
      1) Time of day schedule control from BMS to each area as defined by the lighting control schedule (e.g., corridors, exterior building mounted lighting, site lighting). All time-of-day scheduling required for lighting control to be provided by BMS and not programmed in the lighting control system.
      2) On/off status of each area from lighting control system.
      3) Occupancy status for each area from lighting control system.
      4) Operation and communication status from lighting control system.
   b. Power monitoring - BMS shall integrate the Main Distribution Panel electric meter provided by the electrical contractor. At a minimum BMS contractor shall provide:
      1) Voltage and current for each phase.
      2) kW and kWh accumulated to line up with utility billing cycle.
      3) Power factor, voltage spikes.
      4) Provide a trend for power usage .
   c. Natural gas meter - BMS shall provide and install any required relay or interface to utility meter(s) and calibrate to receive proper volume and rate measurements.
      1) Provide graphic screen to display data such as current CCF usage rate and accumulated CCF lined up with utility billing cycle.
      2) Provide a trend for natural gas usage points.
   d. Domestic water meter - BMS shall provide and install any required relay or interface to utility meter(s) and calibrate to receive proper volume measurements.
      1) Provide graphic screen to display data such as current usage rate and accumulated gallons used lined up with utility billing cycle.
      2) Provide a trend for domestic water usage points.
   e. Automated chemical treatment systems.
   f. Fire-alarm system.
   g. Access control systems.
   h. Video surveillance systems.
   i. SchoolDude scheduling software.

3.5 SYSTEM INTERFACE WITH EXISTING SYSTEMS

A. Integration with Existing Proprietary Control Systems:
   1. Engage Owner's control system provider to expand existing system to incorporate new control systems and components into existing proprietary control system including all new graphics, logs, reports, trends, points, controllers and sequences.
   2. Engage Owner's control system provider to include commissioning of existing and new control systems and components.
   3. Control System Provider Information:
      a. Company:Performance Services
      b. Phone Number:888-390-270

3.6 GENERAL INSTALLATION

A. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.

B. Install software in control units and in operator work station. Implement all features of programs to specified requirements and appropriate to sequence of operation. Refer to Section 23 09 93.

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C. Provide conduit and electrical wiring in accordance with Section 26 05 83. Electrical material and installation shall be in accordance with appropriate requirements of Division 26.

D. Corrosive Environments: Use products that are suitable for environment to which they will be subjected. Conduit, tubing, and enclosures to be minimum 316L stainless steel with an enclosure rating of NEMA 250, 4X.

3.7 CONTROL DEVICES TO BE INSTALLED BY OTHERS

A. Deliver the following control devices in accordance with the construction schedule to the Mechanical Contractor for installation in the ductwork and piping:
   1. Control dampers
   2. Airflow measuring stations
   3. Control Valves
   4. Flow meters.

B. Deliver the following control devices in accordance with the construction schedule to the Electrical Contractor for installation:
   1. Variable frequency drives.

3.8 CONTROL DEVICES FOR FACTORY INSTALLATION

A. Deliver the following control devices in accordance with the equipment production schedule to the Equipment Manufacturer for installation at the factory:
   1. Air Handling Units:
      a. Programmable controller
      b. Control dampers and actuators
      c. Airflow sensors/switches
      d. Pressure sensors/switches
      e. Temperature sensors
      f. Relays
   2. Terminal Units:
      a. Programmable controller
      b. Control damper actuators
      c. Airflow sensors/switches
      d. Pressure sensors/switches
      e. Temperature sensors
      f. Relays
   3. Fan Coil/Blower Coil Units:
      a. Programmable controller
      b. Control damper actuators
      c. Airflow sensors/switches
      d. Pressure sensors/switches
      e. Relays

3.9 SERVER INSTALLATION

A. Coordinate with Owner on final server installation location.

B. Install all required operating software on server(s) and commission operating systems.

C. Provide owner with a copy of all installed software.

D. Power servers via uninterruptable power supply (UPS) system.

3.10 CONTROLLER INSTALLATION

A. Install controllers in enclosures.

B. Power controllers via field power and UPS system.

C. Install all controller with the up to date version of the operating and provide owner with a copy of all installed software.

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D. Commission all controllers in accordance with operating sequences listed in 23 09 93.

3.11 NETWORK NAMING AND NUMBERING

A. Coordinate with Owner naming and numbering for networks and devices.

B. Comply with requirements for ASHRAE Std 135 networks.

C. Naming:
   1. Each device shall be assigned a Device Instance Number (unique within the BACnet network).
   2. Objects within devices (e.g. sensors, actuators) shall be identified by their type and instance.
   3. Use a structured naming convention that includes building, floor, and area.
   4. Include a description of the device's function for clarity.
   5. Group related devices logically to enhance identification and management.
   6. Example Format: B{Building Number}-F{Floor Number}-Z{Zone Number}-D{Device Type}-N{Device Instance}.

D. Numbering:
   1. Use a consistent numbering scheme for instances to ensure uniqueness and ease of identification.
   2. Reflect the physical or logical layout of the system in the numbering.
   3. Similar devices can share a numbering system to indicate their function or location.

3.12 MANUFACTURER'S FIELD SERVICES

A. Start and commission systems. Allow sufficient time for start-up and commissioning prior to placing control systems in permanent operation.

B. Provide service engineer to instruct Owner's representative in operation of systems plant and equipment for 3 day period.

C. Training:
   1. Provide basic operator training for five persons on data display, alarm and status descriptors, requesting data, execution of commands and request of logs. Include a minimum of 40 hours dedicated instructor time over a five day period in two separate weeks. Provide training on site.
   2. Coordinate training schedule and content with Owner a minimum of two week prior to desired training.
   3. Training instructors must have a minimum of five years experience in training and a minimum of five years experience with similar projects/scope.
   4. Provide Owner with a hard copy of all training materials organized in a three ring binder with dividers and table of contents along with a digital copy.
   5. Provide Owner with two copies of the digital video and audio recording of each training session.
   6. Owner retains the right to make additional copies of all training materials.

3.13 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate complete and operating system to Owner.

3.14 SERVICE

A. Provide service of energy management and control systems for two years from Date of Substantial Completion.

B. Provide two complete inspections per year, one in each season, to inspect, calibrate, and adjust controls as required, and submit written reports.

END OF SECTION

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SECTION 23 09 93 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

(ADDENDUM 002)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other sections.

B. Sequence of operation for:
1. Fan Coil/Blower COil with 2-Position Outside Air Damper
2. Hot Water Cabinet Unit Heaters and Unit Heaters
3. Split System Unit
4. Utility Monitoring
5. Emergency Generator and Automatic Transfer Switch
6. Refrigeration Monitoring and Mitigation System
7. Exhaust Fans
8. Lighting Control

1.2 RELATED REQUIREMENTS

A. Section 01 91 13 - General Commissioning Requirements: Commissioning requirements that apply to all types of work.

B. Section 23 09 13 - Instrumentation and Control Devices for HVAC.

C. Section 23 09 23 - Direct-Digital Control System for HVAC.

1.3 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Sequence of Operation Documentation: Submit written sequence of operation for entire HVAC system and each piece of equipment.
1. Preface: 1 or 2 paragraph overview narrative of the system describing its purpose, components and function.
2. State each sequence in small segments and give each segment a unique number for referencing in Functional Test procedures; provide a complete description regardless of the completeness and clarity of the sequences specified in Contract Documents.
3. Include at least the following sequences:
   a. Start-up.
   b. Warm-up mode.
   c. Normal operating mode.
   d. Unoccupied mode.
   e. Shutdown.
   f. Capacity control sequences and equipment staging.
   g. Temperature and pressure control, such as setbacks, setups, resets, etc.
   h. Detailed sequences for all control strategies, such as economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
   i. Effects of power or equipment failure with all standby component functions.
   j. Sequences for all alarms and emergency shut downs.
   k. Seasonal operational differences and recommendations.
   l. Interactions and interlocks with other systems.
4. Include initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.

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5. For packaged controlled equipment, include manufacturer's furnished sequence of operation amplified as required to describe the relationship between the packaged controls and the control system, indicating which points are adjustable control points and which points are only monitored.

C. Control System Diagrams: Submit graphic schematic of the control system showing each control component and each component controlled, monitored, or enabled.
   1. Label with settings, adjustable range of control and limits.
   2. Include flow diagrams for each control system, graphically depicting control logic.
   3. Include the system and component layout of all equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
   4. Include draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.
   5. Include all monitoring, control and virtual points specified in elsewhere.
   6. Include a key to all abbreviations.

D. Points List: Submit list of all control points indicating at least the following for each point.
   1. Name of controlled system.
   2. Point abbreviation.
   3. Point description; such as dry bulb temperature, airflow, etc.
   4. Display unit.
   5. Control point or setpoint (Yes / No); i.e. a point that controls equipment and can have its setpoint changed.
   6. Monitoring point (Yes / No); i.e. a point that does not control or contribute to the control of equipment but is used for operation, maintenance, or performance verification.
   7. Intermediate point (Yes / No); i.e. a point whose value is used to make a calculation which then controls equipment, such as space temperatures that are averaged to a virtual point to control reset.
   8. Calculated point (Yes / No); i.e. a “virtual” point generated from calculations of other point values.

E. Designer's Qualification Statement.

F. Project Record Documents: Record actual locations of components and setpoints of controls, including changes to sequences made after submission of shop drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. BAS / BMS / ATC System Points: The system shall include, as a minimum, those points indicated in the control diagrams and indicated in the Sequence of Operations.

B. Set trends on all hardware points, alarm conditions, motor run times and calculated setpoints to sample at a minimum of 15 minutes (analog points) or on change of state (digital, static setpoints or multi-state conditions) and saved for a minimum of 2 years.

C. Freezestats shall be manual reset type and shall generally be provided in air handling units with a hot water heating coil and outside air capability. A freezestat shall be set to 40° F and be installed downstream of the heating coil. Once the freezestat condition response has been activated, a manual reset at the switch shall be required to allow the system to return to normal.

D. Any differential pressure (DP) switch, high temperature switch, etc., meant for safety shall be manual reset type. A manual reset at the switch shall be required to allow the system to return to normal.

E. All safety devices shall be hardwired to the starter / Variable Frequency Drive (VFD) and shall be monitored via the BAS/BMS.

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F. Any motor controller equipped with an Hand-Off-Auto (HOA) option shall only be controlled by the BAS/BMS when the HOA is in the "auto" position. Safeties such as smoke / fire interlocks, freezestats, pressure safeties, etc. shall shutdown motors when the HOA is in both the “hand” and “auto” positions. It shall not be possible to override or manually bypass any safety device shutdown.

G. All initial field settings and setpoints shall be saved as the default values. These values shall be downloaded to the controller such that they are the default value if the controller loses power.

H. Any pump or fan controlled by a Variable Frequency Drive (VFD):
   1. Program VFD firmware settings:
      a. Set accelerate and decelerate times to 60-90 seconds.
      b. Set to ramp to stop (not coast to stop).
   2. The speed signal sent to the VFD shall be configured such that 0% speed corresponds to 0 Hz and 100% speed corresponds to maximum speed configured on the VFD. Pump / fan motor minimum speed shall be programmed in the BAS/BMS controller. In normal operation either the hardware interface or network interface shall control the motor at or above programmed minimum speed. Refer to ASHRAE Guideline 36.

I. Optimal Start for single zone and multi-zone systems: Using outside temperature, representative room temperature(s) compared to occupied heating and cooling setpoints and time schedule, calculate the optimal time to start each air handling unit before programmed occupied period (up to a maximum of 3 hours) to achieve comfort settings by scheduled occupancy start time. Automatically and continuously recalculate the algorithm to better predict building performance. The tuning process shall be turned on or off by a software switch to allow tuning to be stopped after system has been trained. Unit to go to unoccupied mode using the time schedule stop time. Do not use optimized stop. Refer to ASHRAE Guideline 36.

J. Zone setpoint requirements – Each zone shall have separate occupied and unoccupied heating and cooling setpoints. Refer to ASHRAE Guideline 36. The active setpoint(s) shall be determined by the operating mode of the associated AHU or zone group.
   1. Software shall prevent the following:
      a. The heating setpoint from exceeding the cooling setpoint minus 1°F. (i.e., the minimum difference between heating and cooling setpoints shall be1°F). It is recommended to have a 3°F difference between occupied heating and cooling setpoints.
      b. The unoccupied heating setpoint from exceeding the occupied heating setpoint and the unoccupied cooling setpoint from being less than the occupied cooling setpoint

K. Zone Temperature Unoccupied Setback - Unoccupied heating setpoint shall be a minimum of 10°F below the occupied heating setpoint and unoccupied cooling setpoint shall be a minimum of 5°F above the occupied cooling setpoint.

L. Economizer Mode – Economizer shall be enabled whenever the outside temperature is below 65°F and enthalpy is less than 28 btu/lb.

3.2 FAN COIL / BLOWER COIL UNITS WITH 2-POSITION OUTSIDE AIR DAMPER

A. Safeties / Alarms / General Settings
   1. Supply Air Low Temperature Monitor – If unit supply temperature drops below 42°F while unit supply fan is running, disable unit fan, close outside air damper and open unit heating control valve. Send alarm. If supply temperature rises above 50°F for a period of 10 minutes, return unit to normal operation.
   2. Fan Failure - Monitor status on unit fan. If fan is enabled and status indicates off for a period of 2 minutes or more, send alarm.
   3. Outside air damper is allowed to open only when the unit supply fan is enabled, fan status indicates on and no other safeties are tripped.
   4. Condensate Pan Overflow Monitoring - If the condensate level switch reaches the trip point, disable unit fan disable cooling and send alarm.

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B. Unit Supply Air Temperature (SAT) Setpoint Reset:
   1. Heating Mode: As room temperature drops below active heating setpoint, reset calculated SAT setpoint from 75°F toward a maximum of 95°F.
   2. Cooling Mode: As room temperature rises above active cooling setpoint, reset the calculated SAT setpoint from 65°F toward a minimum of 55°F (adj.).
   3. Deadband Mode: If room temperature is between active heating and cooling setpoints, set SAT setpoint to the average of the active heating and cooling setpoints.

C. Supply Fan Operation: When unit fan is enabled, set fan speed to a minimum of 50%. If unit is in Heating Mode, SAT is at maximum setpoint and heating demand continues to rise or SAT is at minimum setpoint and cooling demand continues to rise, slowly increase fan speed. Modulate fan at the lowest speed possible to maintain room temperature at active heating and cooling setpoints.

D. Occupied Mode:
   1. When time schedule indicates occupied mode set active heating and cooling setpoints
      a. Set active heating setpoint to Occupied Heating Setpoint (70°F – adj.) and active cooling setpoint to Occupied Cooling Setpoint (75°F – adj.).
   2. Enable supply fan (if not already enabled) and run continuously. Modulate fan speed as outlined above.
   3. Open the outside air damper to minimum outside position (confirm minimum damper setting with air balance).
   4. As room temperature rises above active cooling setpoint, enable cooling mode. Modulate chilled water valve to maintain supply air temperature at calculated SAT setpoint.
   5. As room temperature drops below active heating setpoint, enable heating mode. Modulate heating to maintain SAT to calculated SAT setpoint.
   6. If room temperature is between active heating and cooling setpoints, close heating and disable cooling. Modulate heating to maintain a minimum supply temperature of 65°F.

E. Unoccupied Mode
   1. When time schedule indicates unoccupied mode, set active heating setpoint to Unoccupied Heating Setpoint (60°F – adj.) and active cooling setpoint to Unoccupied Cooling Setpoint (80°F – adj.). Disregard zone local setpoint adjust and zone occupancy sensor status.
   2. Disable unit supply fan and close outside air damper.
   3. Unoccupied Heating Mode: If zone temperature drops below unoccupied heating setpoint, operate unit fan and heating in Morning Warmup Mode. Disable unit supply fan when zone reaches unoccupied heating setpoint.
   4. Unoccupied Cooling Mode. If zone temperature rises above unoccupied cooling setpoint, operate unit in Morning Cooldown Mode. Disable unit supply fan when zone reaches unoccupied cooling setpoint.
   5. Unoccupied Override - If room sensor has an unoccupied override button and it is programmed to be enabled, set the unit to occupied mode as outlined above for a programmed period (2 hours – adj.) when the button is pressed.

3.3 UNIT HEATERS AND CABINET UNIT HEATERS

A. Enable unit operation when boiler system is enabled, supply pump(s) are running, and supply water temperature is above 90°F.

B. Occupied Mode – Unit heating valve is closed, and unit fan is off. When room temperature drops below occupied heating setpoint (60°F adj.), open unit heating valve and start unit fan.

C. Unoccupied Mode - Unit heating valve is closed, and unit fan is off. When room temperature drops below unoccupied heating setpoint (52°F adj.), open unit heating valve and start unit fan.

D. If the room falls more than 5°F below setpoint for longer than 30 minutes when boiler system is enabled, send low priority alarm. If there is a fault with zone sensor send low priority alarm.

E. Hot Water Plant Requests:

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1. If the HW coil valve is greater than 95%, send (1) request to HW plant until HW valve is less than 10%.
2. Else if the HW valve position is less than 95%, send (0) requests.

3.4 SPLIT SYSTEM AIR CONDITIONING UNITS

A. Split System AC units shall come with factory controls to maintain space at setpoint.

B. Integrate factory controller. Provide space temperature and unit conditions on a graphic screen. BAS/BMS to provide time schedule input to unit is space is designed for occupancy. If space is designed for equipment cooling or other special purpose use, monitor conditions only.

C. Outside air damper is allowed to open only when the unit supply fan is enabled, fan status indicates on and no other safeties are tripped.

D. Open the outside air damper to minimum outside position (confirm minimum damper setting with air balance).

E. Alarms: If space temperature rises above setpoint for more than 30 minutes, send alarm. If unit indicates a failure, send alarm.

3.5 UTILITY MONITORING

A. Main Distribution Panel: BAS/BMS shall integrate the Main Distribution Panel electric meter provided by the electrical contractor.
   1. Phase Loss: If the incoming voltage drops more than 15% on any phase shut off all 3-phase motors and alarm. Upon restoration of proper power, restart the associated HVAC system motors in a staggered sequence.
   2. Provide graphic screen displaying relevant points. Program a trend on incoming voltage and amp draw (on each phase) and KW and KWh usage.

B. Natural Gas Meter(s): BAS/BMS shall monitor building natural gas meter(s) provided by utility. Program a trend and provide graphic screen for current usage and accumulated usage since last reset.

C. Domestic Water Meter(s): BAS/BMS shall monitor building domestic water meter(s). Program a trend and provide a graphic screen for current usage and accumulated usage since last reset.

3.6 EMERGENCY GENERATOR AND AUTOMATIC TRANSFER SWITCH

A. BAS/BMS shall monitor the status of the generator and shall alarm if generator is energized.

B. Automatic Transfer Switch: Integrate ATS. Provide a graphic screen displaying all pertinent points. Program a trend on status of ATS, voltage and amp draw (on each phase) and KW and KWh usage.

3.7 REFRIGERANT MITIGATION SYSTEM

A. BAS/BMS shall monitor refrigerant levels to detect equipment/system refrigerant leaks.

B. Refrigerant Alarm: If refrigerant levels exceed 20% of the lower explosive limit (LEL) for the specified refrigerant, an audible and visual alarm shall be triggered and the required mitigation system shall be activated. The BAS/BMS shall keep track of all alarm events as well as refrigerant levels.

C. Mitigation System: Upon automatic activation or activation by the BAS/BMS, the associated ventilation system shall operated. The associated equipment shall shut down (unless required as part of the mitigation system), dampers shall open and fans shall operate continuously. Airflow shall be monitored and trended to assure that the required levels are maintained.

D. All refrigerant sensors shall be calibrated annually or as required by sensor manufacturer.

E. Refrigerant mitigation system shall meet the requirements of NFPA 70 and ASHRAE Std 15 and shall be tested annually at a minimum.

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3.8 EXHAUST FANS

A. General Exhaust and Toilet Exhaust: Fan shall operate continuously when associated time schedule indicates occupied mode. Fan shall enable if associated space occupancy sensor indicated occupants. Disable in unoccupied mode, unless otherwise noted on drawings.

B. Mechanical Rooms: Exhaust fan shall operate to maintain space temperature at 80°F. Where provided, associated motorized intake damper shall open whenever exhaust fan operates.

C. Fan Failure - Monitor status on all exhaust fans. If any fan is enabled (by BAS/BMS) and status indicates off for a period of 2 minutes or more, send alarm.

3.9 LIGHTING CONTROL

A. Direct BAS/BMS Control of Lighting Circuits: The BAS/BMS shall directly control various lighting circuits and contactors. See lighting drawings and schedule for control details.

1. Wall pack / exterior building mounted lighting – When wall pack lighting time schedule (separate or combined with site lighting schedule) indicates on, enable lighting circuit. Disable when time schedule indicates off.

a. For areas controlled by time schedule only, enable lighting circuit when any time schedule affecting this area is on occupied mode.

END OF SECTION

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Questions & Answers

GMB Project: 5-6394 Western Wayne Schools Renovations - Bid Package #1

Topic/Discipline/Reference	*Question*	*Answer*
Electrical	Who is the contact for Duke Energy that has coordinated scope?	William Stockberger 812-363-5346 william.stockberger@duke-energy.com
New versus Existing Lockers	I don't see call outs for "New" Lockers. I only see tags for existing lockers to be relocated. Is the intent to have new lockers on this project? If so, what are the sizes and tiers? The specs are drawings are conflicting.	If lockers are not specifically called out as existing to be reinstalled, they are new lockers to be ordered and installed.
Display Cases	It appears that display cases are in Lobby A127 though I don't see them called out on the floor plan or elevations. Can you confirm the sizes and locations?	Refer to reissued A2.1A for more information.
Room A128 Center Island	Room A128 – are there any new cabinets required at the center island? No notes or elevations where provided.	Refer to reissued A8.01 for more information.
Spray Insulation Substitution Request	Can XLS 2000 Closed-Cell Spray Foam	This product may be used.
Hospitality Room Elevations	Room a105 has elevations called out on sheet A8.04. This sheet is not in the document set. Can you please issue this sheet	Refer to reissued A2.81 and A8.01 for more information.
Painting Existing Lockers	I have a painting contractor who is concerned about the painting for the existing lockers. He said typically it would be an electrostatic paint application. He just wanted to verify if it is ok to quote per the drawings and specs or if that needs to be looked into by your team at all. Do you know who provided those lockers originally?	Existing lockers are to have the existing finish ground down in the field and new paint to match the new lockers being ordered. New lockers ordered are to have the factory applied electrostatic paint. The contractor may provide a cost for refinishing the existing lockers in the field as described in the contract documents and electrostatic painting of the existing lockers for the owner's consideration.

Display Cases	1/a7.05 shows laminate panels around the display case. 2/a8.01 the corresponding elevation for the display case areas show all the walls are painted. Can you clarify if the laminate panels are required?	Finished laminate panels are to be used in the display cases where they are visible to the lobby. Such as the interior of the display cases. Unfinished faces of panels may be used where they are not visible from the lobby. Such as faces that are encased by wall construction.
Manufactured Wood Casework Substitution Request	Stevens Industries 1100 Series Plastic Laminate Casework	This product may be used.
Manufactured Wood Casework Substitution Request	PR Bean	This product may not be used. Product data was not included to compare the manufacturer's product data to the specified products data.
Cast-In-Place Concrete Substitution Request	SINAK LithoHard	This product cannot be reviewed as a substitution at this time. This product may be submitted during construction after reviewing the concrete mix design submittal.
Cast-In-Place Concrete Substitution Request	SINAK VC-5	This product cannot be reviewed as a substitution at this time. This product may be submitted during construction after reviewing the concrete mix design submittal.

PLUMBING FIXTURE COUNTS

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS		LAVATORIES		DRINKING FOUNTAINS	OTHER
				MALE	FEMALE	MALE	FEMALE		
1	ASSEMBLY (1,694 OCCUPANTS)	A-4	GYM WITH SPECTATOR SEATING	1 PER 75 REQUIRED 12 ACTUAL 23	1 PER 40 REQUIRED 22 ACTUAL 20	1 PER 200 REQUIRED 5 ACTUAL 12	1 PER 150 REQUIRED 6 ACTUAL 11	1 PER 1000 REQUIRED 2 ACTUAL 8	1 SERVICE SINK REQUIRED 1 ACTUAL 1
				4 ADDITIONAL B.F. UNISEX		1 ADDITIONAL B.F. UNISEX			
3	EDUCATIONAL (300 STUDENTS XX STAFF)	E	EDUCATIONAL FACILITIES	1 PER 50 REQUIRED 4 ACTUAL 10	1 PER 50 REQUIRED 4 ACTUAL 7	1 PER 50 REQUIRED 4 ACTUAL 6	1 PER 50 REQUIRED 4 ACTUAL 7	1 PER 100 REQUIRED 4 ACTUAL X	1 SERVICE SINK REQUIRED 1 ACTUAL 1
				1 ADDITIONAL B.F. UNISEX		2 ADDITIONAL B.F. UNISEX			

LIFE SAFETY NOTES

1. CODE: NFPA 101, 2012 LIFE SAFETY CODE, AS AMENDED BY STATE FIRE MARSHAL
   2012 INDIANA BUILDING CODE
2. CONSTRUCTION TYPE: II (000)
   UN-PROTECTED WITH AUTOMATIC FIRE SPRINKLER SYSTEM
   HAZARD OF CONTENTS: ORDINARY HAZARD
3. OCCUPANCY: EDUCATIONAL OCCUPANCY (SPACES SUBJECT TO "ASSEMBLY" OCCUPANCY NOTED ON PLAN)
4. AREA & HEIGHT:
   ALLOWABLE AREA: 142,672 SQ. FT. (REFER TO CALCULATIONS ON SHEET)
   ALLOWABLE HEIGHT: 1 STORY
   SMOKE COMPARTMENTS: MINIMUM OF 2 COMPARTMENTS, MAXIMUM OF 30,000 SQ. FT. EACH
5. SEPARATION & PROTECTION:
   CORRIDORS SHALL BE SMOKE TIGHT.
   FIRE AREAS: SEPARATED W/ 2-HR FIRE SEPARATION & 90-MIN. OPENING PROTECTIVES.
   BOILER & FURNACE ROOMS, STORAGE AREAS, AND CUSTODIAL CLOSETS: 1-HR RATED SEPARATION & OPENING PROTECTIVES WHERE REQUIRED.
6. OCCUPANT LOAD: (BASED ON FOLLOWING - SEE PLAN)
   ASSEMBLY (CONFERENCE, DINING, GYMNASIUM): 1/15 SF NET
   BUSINESS: 1/100 SF GROSS
   CLASSROOMS: 1/20 SF NET
   KITCHENS: 1/100 SF GROSS
   LIBRARIES (READING AREAS): 1/50 SF NET
   LIBRARIES (STACK AREAS): 1/100 SF GROSS
   LOCKERS: 1/7 SF NET, OR 1/15 SF GROSS INCLUDING SHOWERS, TOILETS & DRYING
   MECHANICAL EQUIPMENT: 1/300 SF GROSS
   SHOPS, LABS, VOC. ROOMS: 1/50 SF NET
   STAGES: 1/15 SF NET
   STORAGE: 1/300 SF GROSS
7. EGRESS REQUIREMENTS:
   A. 6'-0" MINIMUM CORRIDOR WIDTH (CORRIDOR CAPACITY = OCCUPANT LOAD/REQUIRED NUMBER OF EXITS)
   B. EGRESS WIDTHS - 0.2" PER PERSON (LEVEL OR RAMPED)
   C. 200' MAXIMUM TRAVEL DISTANCE
   D. 20' DEAD-END MAXIMUM TRAVEL IN CORRIDOR.
   E. 75' MAXIMUM COMMON PATH OF TRAVEL
   F. EXITS:
      (1) 2 REMOTE EXITS REQUIRED FOR EDUCATIONAL SPACES >50 PEOPLE OR >1,000 SQ. FT. IN AREA
      (2) MINIMUM NUMBER PER OCCUPANTS: 2 IF < 501, 3 IF < 1001, 4 IF > 1000
      (3) WINDOWS FOR RESCUE REQUIRED IN BUILDINGS NOT PROTECTED BY AUTOMATIC SPRINKLER SYSTEM
      (4) PANIC HARDWARE AT AREAS >100 OCCUPANT LOAD IF DOOR PROVIDED WITH LATCH OR LOCK.
      (5) DISCHARGE: ALL EXITS SHALL TERMINATE AT A PUBLIC WAY OR AN EXTERIOR EXIT DISCHARGE
   G. HORIZONTAL EXITS:
      (1) SUBSTITUTED FOR NO MORE THAN ONE-HALF OF REQUIRED EXITS
      (2) FIRE BARRIERS SEPARATING BUILDING AREAS WITH HORIZ. EXITS BETWEEN SHALL BE 2-HOUR RATED
      (3) WHERE SERVING BOTH SIDES OF FIRE BARRIER ADJACENT OPENINGS REQUIRED WITH DOORS SWINGING IN OPPOSITE DIRECTIONS
   H. DOORS:
      (1) MINIMUM CLEAR WIDTH SHALL BE 32"
      (2) SIDE HINGED
      (3) SWING IN DIRECTION OF TRAVEL WHERE OCCUPANT LOAD IS > 50
      (4) SELF-CLOSING OR AUTOMATIC-CLOSING IN FIRE BARRIERS AND HORIZONTAL EXITS
8. INTERIOR FINISH:
   A. EXITS - CLASS A
   B. ALL OTHER - CLASS A OR B.
   C. INTERIOR WALL & CEILING FINISH IF LESS THAN 10% OF AGGREGATE WALL & CEILING AREAS OF ANY ROOM MAY BE CLASS C.
9. OTHER PROVISIONS:
   BUILDING CONSTRUCTION - INDIANA BUILDING CODE 2012
   ELECTRICAL - 2023 NFPA 70 (NEC) AS AMENDED BY MICHIGAN PART 8 RULES
   MECHANICAL - INDIANA MECHANICAL CODE 2014
   PLUMBING - INDIANA PLUMBING CODE 2012
   FIRE ALARM SYSTEM - NFPA 70 & 72
   FIRE EXTINGUISHERS - NFPA 10
   FIRE SPRINKLERS - NFPA 13

FIRESTOPPING REQUIREMENT

ALL OPENINGS AROUND MECHANICAL, PLUMBING, ELECTRICAL, AND STRUCTURAL PENETRATIONS THRU A FIRE RESISTIVE RATED ASSEMBLY (INCLUDING FLOORS) SHALL BE SEALED WITH FIRE RATED FIRESTOPPING IN COMPLIANCE WITH ASTM E814 AND EQUIVALENT TO FIRE RATING REQUIRED. PENETRATIONS THRU SMOKE RESISTIVE NON-FIRE RATED ROOM, WALLS SHALL BE SEALED SMOKE TIGHT

GENERAL CODE NOTES:

A. FIRE DEPARTMENT ACCESS AND WATER SUPPLY SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF VERTICAL CONSTRUCTION.

B. FIRE STOP ALL INTERCONNECTIONS BETWEEN VERTICAL AND HORIZONTAL SPACES AND CONCEALED WALL SPACES AT THE CEILING, FLOOR, AND ROOF LEVELS.

C. INSTALL SOLID BLOCK BEHIND ALL RECESSED WALL UNITS AS REQUIRED TO MAINTAIN FIRE RATINGS.

D. ALL FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS, AND SMOKE PARTITIONS SHALL BE IDENTIFIED WITH STENCILING AT INTERVALS NOT TO EXCEED 30'. REFER TO CODE PLAN FOR WALLS REQUIRED TO BE PROTECTED.

E. ALL PENETRATIONS AT SMOKE AND FIRE RATED WALLS, FLOORS, CEILINGS, ETC. SHALL BE PROTECTED, SEALED OR DAMPERED USING ONLY U.L. AND / OR C.B.O. APPROVED METHODS, MATERIALS AND INSTALLATION.

F. SEE REFLECTED CEILING PLANS AND LIGHTING PLANS FOR EXIT SIGNAGE LOCATIONS.

G. ALL EXITS TO BE OPENABLE FROM THE INSIDE WITHOUT THE USE OF KEY OR SPECIAL KNOWLEDGE.

H. ALL ELEVATORS SHALL COMPLY WITH A.D.A., A.D.A.G.G. AND A.N.S.I. REQUIREMENTS.

I. SPECIAL STRUCTURAL INSPECTIONS ARE REQUIRED. REVIEW GENERAL STRUCTURAL NOTES AND SPECIFICATIONS FOR REQUIREMENTS.

J. FIRE SPRINKLERS AND FIRE ALARM SYSTEM SHALL BE PROVIDED PER NFPA NO. 13, 70 & 72. SUBMIT ALL REQUIRED DRAWING AND INFORMATION TO THE AUTHORITY HAVING JURISDICTION FOR APPROVAL PRIOR TO COMMENCEMENT OF ANY RELATED WORK. OBTAIN APPROVAL OF COMPLETED SYSTEMS PRIOR TO FINAL ACCEPTANCE.

LEGEND - CODE COMPLIANCE PLAN

2-HR FW — **FIRE WALLS (IBC SECTION 706)**
CREATE SEPARATE BUILDINGS. 2-HOUR FIRE RESISTANCE RATING, STRUCTURALLY ENGINEERED. 90-MINUTE SELF-CLOSING DOORS. GLAZING ONLY ALLOWED IF DESIGNED AND TESTED AS A WALL. GLAZED OPENINGS ARE PERMITTED IF RATED AS A WALL, PER ASTM E119 AND SECTION 716.2 (IBC) IN MAXIMUM SIZE TESTED.

2-HR FB — **2-HR FIRE BARRIER (IBC SECTION 707 / NFPA 101 - 8.3)**
FIRE BARRIER (2-HOUR FIRE RESISTANCE RATING REQUIRED). INSTALL FROM FLOOR SLAB TO UNDERSIDE OF ROOF DECK ABOVE. 90-MINUTE SELF-CLOSING DOORS (100 SQUARE INCHES MAXIMUM DOOR VISION PANEL). GLAZED OPENINGS ARE PERMITTED IF 2-HOUR RATED, PER ASTM E119 AND TABLE 716.5 (IBC) AND TABLE 8.3.4.2 (NFPA 101). OPENING SHALL BE LESS THAN 25% OF THE COMMON CORRIDOR WALL PER ROOM.

1-HR FB — **1-HR FIRE BARRIER (IBC SECTION 707 / NFPA 101 - 8.3)**
FIRE BARRIER (1-HOUR FIRE RESISTANCE RATING REQUIRED). INSTALL FROM FLOOR SLAB TO UNDERSIDE OF ROOF DECK ABOVE. OPENING SHALL BE LESS THAN 25% OF THE WALL. OPENING PROTECTIVES DEPEND ON TYPE OF ASSEMBLY PER TABLE 716.5 (IBC) AND TABLE 8.3.4.2 (NFPA 101).

CORRIDOR — **(CORRIDOR) FIRE BARRIER (IBC SECTION 707 / NFPA 101 - 8.3)**
CORRIDOR FIRE BARRIER (1-HOUR FIRE RESISTANCE RATING REQUIRED). INSTALL FROM FLOOR SLAB TO UNDERSIDE OF ROOF DECK ABOVE. 20-MINUTE SELF-CLOSING DOORS. GLAZED OPENINGS ARE PERMITTED IF 3/4-HOUR RATED, PER ASTM E119 IN THE MAXIMUM SIZE TESTED. OPENING SHALL BE LESS THAN 25% OF THE COMMON CORRIDOR WALL PER ROOM.

1-HR SB — **SMOKE BARRIER (IBC SECTION 709 / NFPA 101 - 8.5)**
SMOKE BARRIER (1-HOUR FIRE RESISTANCE RATING REQUIRED). DIVIDE BUILDING INTO COMPARTMENTS TO RESTRICT MOVEMENT OF SMOKE. INSTALL FROM FLOOR SLAB TO UNDERSIDE OF ROOF DECK ABOVE 20-MINUTE SELF-CLOSING OR SMOKE ACTIVATED LABEL DOORS. GLAZED OPENINGS ARE PERMITTED IF 3/4-HOUR RATED, PER ASTM E119 IN THE MAXIMUM SIZE TESTED. OPENING SHALL BE LESS THAN 25% OF THE COMMON CORRIDOR WALL PER ROOM.

SMOKE SP — **SMOKE PARTITION (IBC SECTION 710 / NFPA 101 - 8.4)**
SMOKE PARTITION (NO FIRE RESISTANCE RATING) FROM FLOOR SLAB TIGHT TO ROOF DECK OR SOLID CEILING ABOVE. GLAZED OPENINGS ARE PERMITTED (NO RATING REQUIRED) "PER NFPA 101 14.3.6(2)(B) SELF-CLOSING DOORS PER 8.4.3.5 ARE NOT REQUIRED FOR NORMALLY OCCUPIED CLASSROOMS"

64" W. — BUILDING EXIT WITH EGRESS WIDTH

46 — OCCUPANT LOAD

20 — DENOTES FIRE RESISTANCE RATING OF OPENING PROTECTIVE (IN MINUTES)

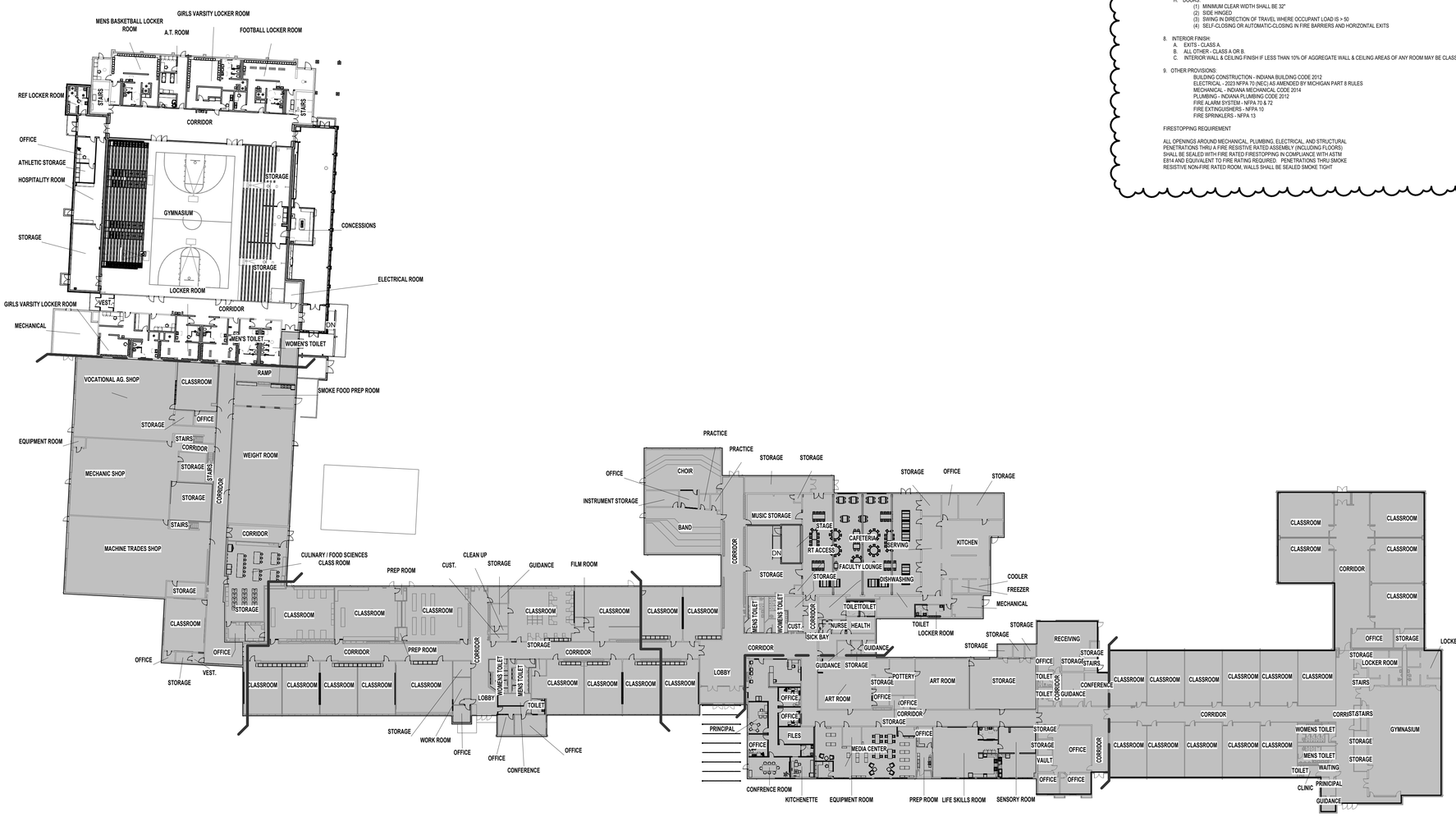
P — DENOTES PANIC HARDWARE DEVICE ON EACH DOOR LEAF

FE — FIRE EXTINGUISHER

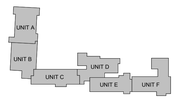
"ACCESSIBLE" ROUTE/ENTRANCE/EGRESS

E — EGRESS WINDOW LOCATION

NOT IN SCOPE



CODE COMPLIANCE PLAN
1/32" = 1'-0"



KEYPLAN

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.22.2025 ADDENDUM 002

DRAWN NCB
REVIEWED AGS

PROJECT NO. 5-6394

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CODE COMPLIANCE PLAN

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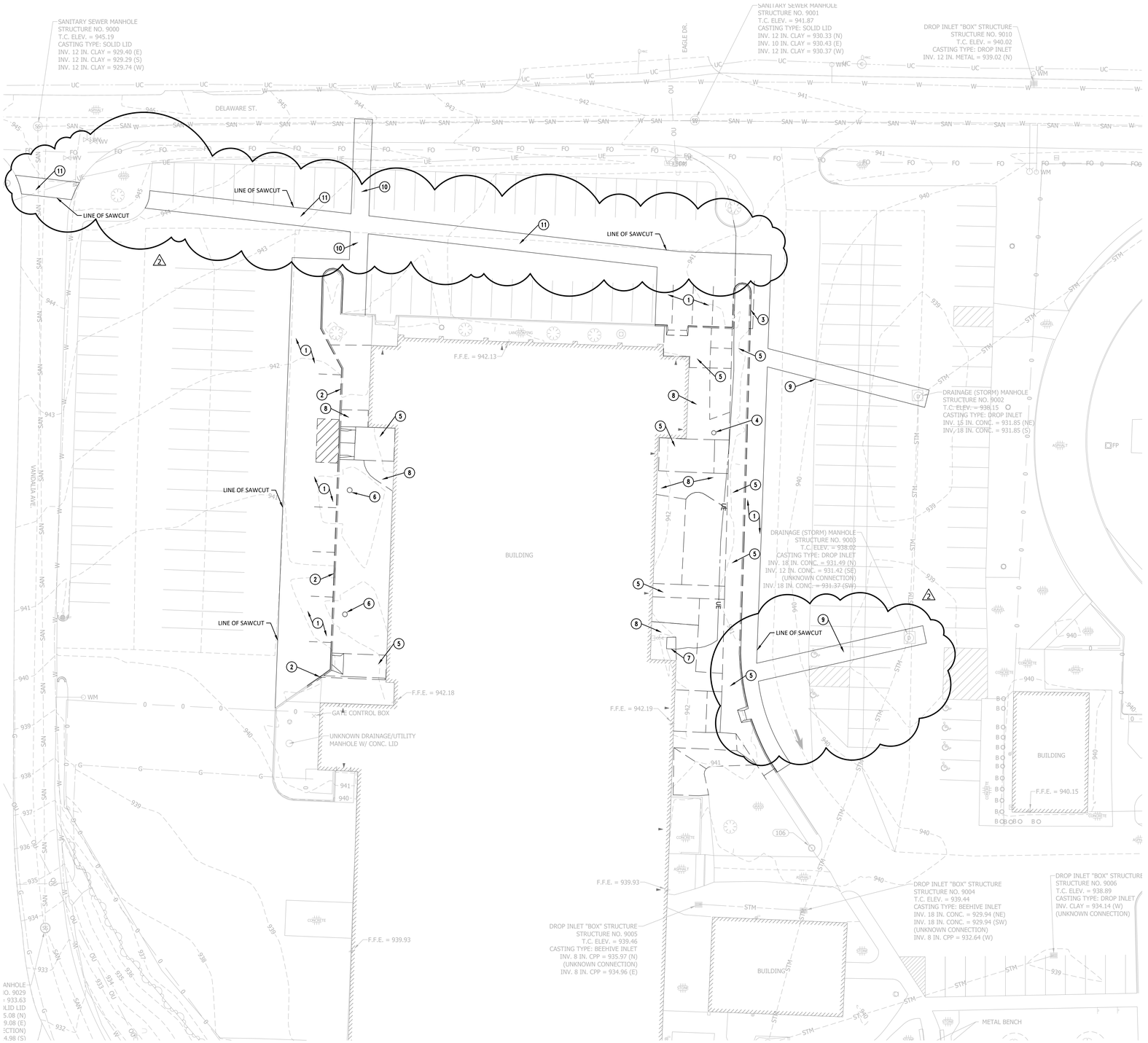

PLAN NOTES

1. REMOVE EXISTING ASPHALT PAVEMENT COMPLETE. MAKE STRAIGHT SAW-CUT AT TERMINATION.
2. REMOVE EXISTING CONCRETE CURB COMPLETE. MAKE STRAIGHT SAW-CUT AT TERMINATION.
3. REMOVE EXISTING CONCRETE WALK AND CURB COMPLETE. MAKE STRAIGHT SAW-CUT AT NEXT ADJACENT JOINT.
4. REMOVE EXISTING PLANTINGS COMPLETE.
5. REMOVE EXISTING CONCRETE WALK COMPLETE.
6. REMOVE EXISTING LIGHT COMPLETE.
7. RELOCATE TRANSFORMER.
8. REMOVE GRAVEL.
9. SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT AS NEEDED TO INSTALL STORM SEWER LINE. PATCH ASPHALT AND RESTORE AREA BACK TO ORIGINAL CONDITION AFTER STORM LINE IN INSTALLED AND OPERATIONAL.
10. SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT AS NEEDED TO INSTALL SANITARY SEWER LINE. PATCH ASPHALT AND RESTORE AREA BACK TO ORIGINAL CONDITION AFTER SANITARY LATERAL IS INSTALLED AND OPERATIONAL.
11. SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT AS NEEDED TO INSTALL ELECTRICAL LINE. PATCH ASPHALT AND RESTORE AREA BACK TO ORIGINAL CONDITION AFTER ELECTRICAL LINE IS INSTALLED AND OPERATIONAL.

0 20 40 FEET
SCALE:1"=20'

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025	BIDS & CONSTRUCTION
01.16.2025	ADDENDUM #1
01.22.2025	ADDENDUM #2

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REVIEWED	ADS
PROJECT NO.	5-6394

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SITE DEMOLITION SHEET

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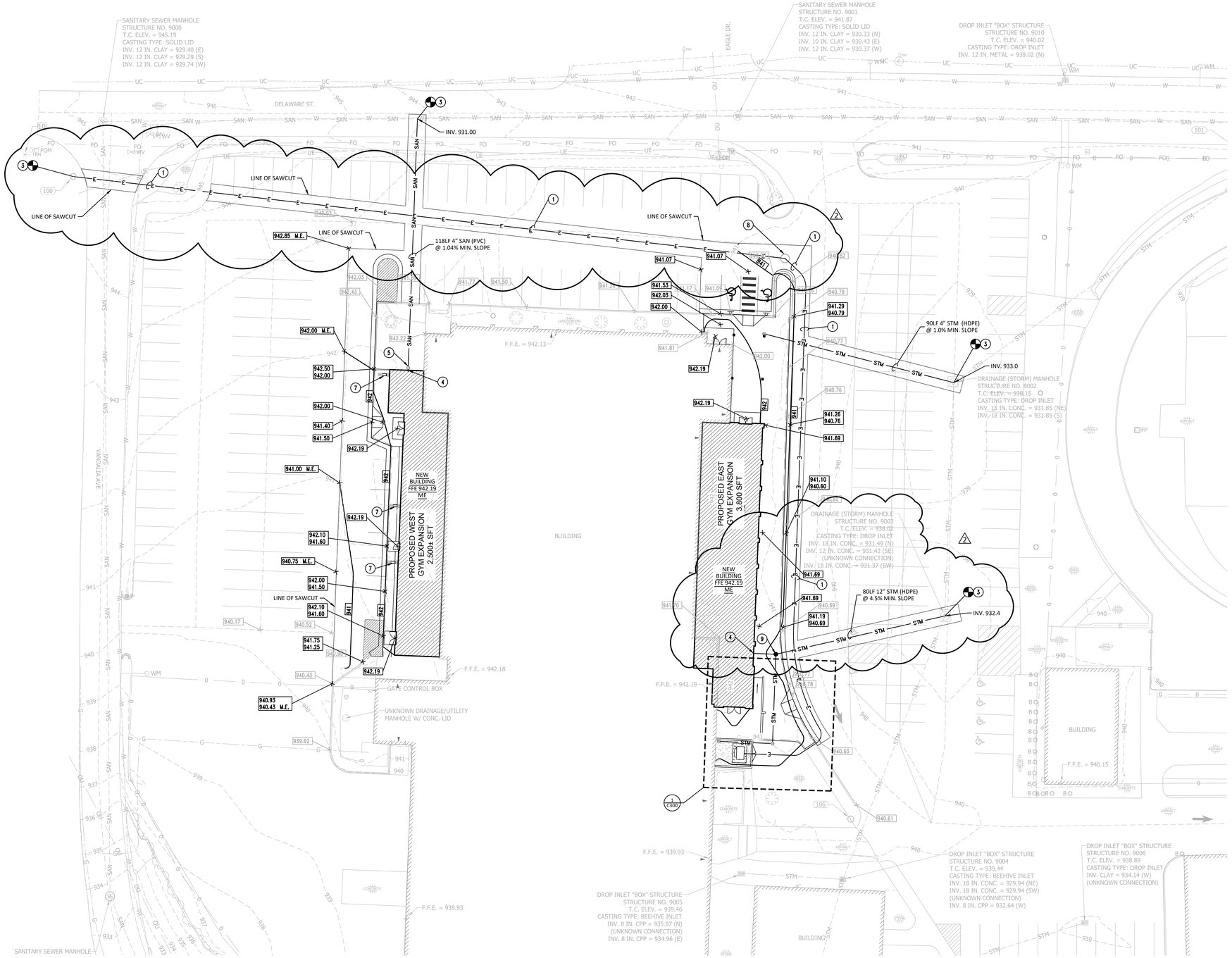


GENERAL NOTES

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AND VERIFYING, THAT ALL PERMITS AND APPROVALS ARE OBTAINED FROM THE RESPECTIVE CITY, COUNTY, STATE AND FEDERAL AGENCIES PRIOR TO STARTING CONSTRUCTION.

B. CONTRACTOR SHALL VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING SEWERS PRIOR TO START OF CONSTRUCTION.

C. CONTRACTOR SHALL MAINTAIN A COMPLETE AND OPERABLE UTILITY SYSTEM AT ALL TIMES.

D. CONTRACTOR SHALL INCLUDE COSTS FOR CUTTING AND PATCHING AS REQUIRED IN THEIR BID PROPOSAL TO COMPLETELY INSTALL THE WORK INDICATED.

E. CONTRACTOR SHALL INCLUDE ALL TAP FEES, PERMIT FEES AND APPLICATION FEES IN THEIR BID PROPOSAL AS NECESSARY TO COMPLETELY INSTALL THE WORK INDICATED.

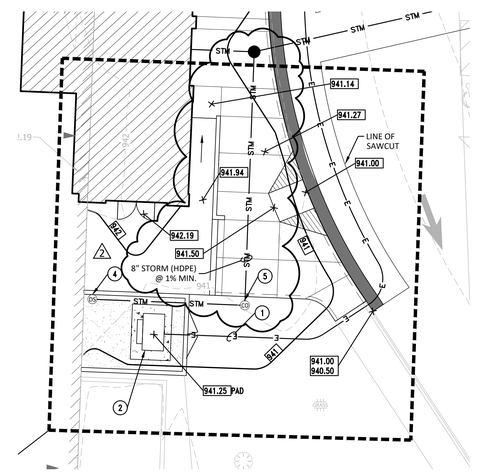
F. INFORMATION SHOWN WAS OBTAINED FROM AN OWNER FURNISHED SITE SURVEY OF EXISTING CONDITIONS AND IS UNCONFIRMED. CONTRACTOR IS REQUIRED TO FIELD VERIFY THIS INFORMATION AND NOTIFY ARCHITECT OF ANY DISCREPANCIES SO MODIFICATION CAN BE MADE.

G. CONTRACTOR SHALL COORDINATE EXACT UTILITY LOCATIONS WITH THE OWNER AND LOCAL UTILITY COMPANIES PRIOR TO COMMENCING ANY WORK. UTILIZE THE INDIANA UNDERGROUND UTILITY LOCATION SERVICE AT 811 OR 800-382-5544 PRIOR TO ANY EXCAVATION ON THE SITE.

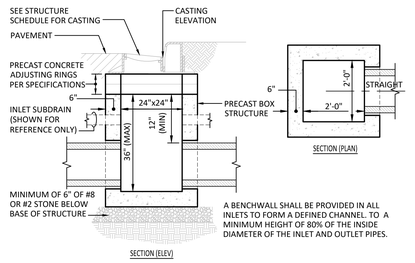
2 H. NEW STORM INLET REFER TO DETAIL. SOLID TOP CASTING, TYPE NEENAH R-1772. TOP OF CASTING 941.0: INVERT IN OF 8" PIPES AT 937.0: 12" STORM INVERT OUT OF STRUCTURE AT 936.0.

○ PLAN NOTES

1. NEW ELECTRICAL LINE. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
2. NEW TRANSFORMER. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. CONTRACTOR TO FIELD VERIFY EXISTING STORM SEWER LOCATION, ELEVATION AND SIZE.
4. COORDINATE SIZE, LOCATION AND ELEVATION OF PIPING WITH PLUMBING PLANS.
5. NEW EXTERIOR CLEANOUT.
6. WATER AND SEWER CROSSING, MINIMUM 18" CLEARANCE OR USE CONCRETE CRADLE.
7. NEW SPLASH BLOCK AND RIP RAP AT ALL DOWNSPOUT LOCATIONS.
8. NEW ELECTRICAL MANHOLE. REFER TO ELECTRICAL PLANS FOR MORE INFORMATION.



1 ENLARGEMENT
SCALE: 1"=10'



A BENCHWALL SHALL BE PROVIDED IN ALL INLETS TO FORM A DEFINED CHANNEL. TO A MINIMUM HEIGHT OF 80% OF THE INSIDE DIAMETER OF THE INLET AND OUTLET PIPES.

2 INLET BOX DETAIL (24"x24")
NO SCALE

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES	
01.06.2025	BIDS & CONSTRUCTION
01.16.2025	ADDENDUM #1
01.22.2025	ADDENDUM #2

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SITE GRADING, DRAINAGE, & UTILITY PLAN

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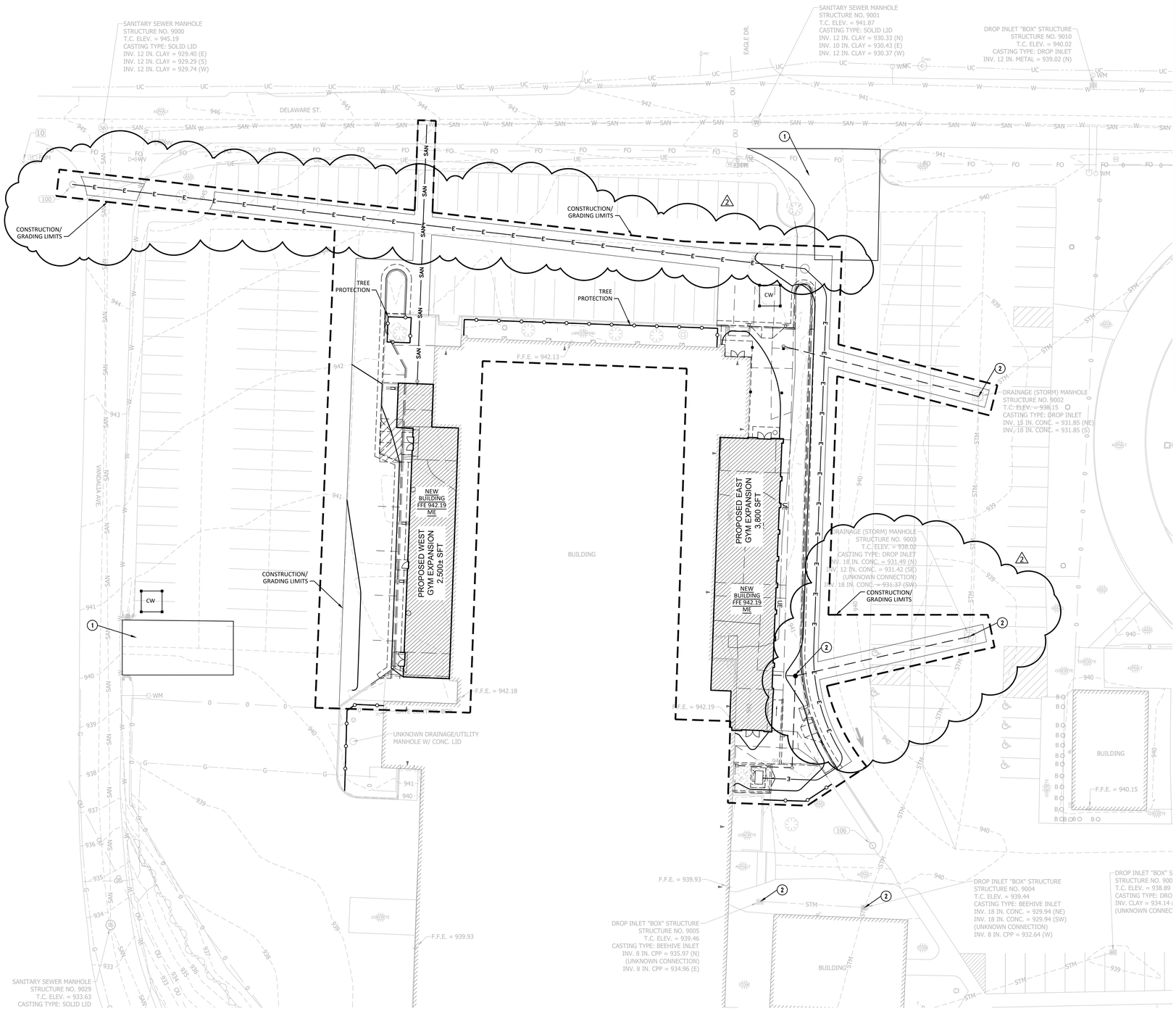

GENERAL NOTES

A. TEMPORARILY SEED ALL DISTURBED AREA.
B. REFER TO LANDSCAPE SHEETS FOR AREAS OF PERMANENT SEEDING AND/OR SOD.
C. REFER TO STORMWATER POLLUTION PREVENTION NOTES AND DETAIL SHEETS.
D. ALL PROPOSED EROSION AND SEDIMENT CONTROL SHALL BE IN CONFORMANCE WITH CHAPTER 600 OF THE CITY OF INDIANAPOLIS STORMWATER SPECIFICATIONS MANUAL, LATEST EDITION. DISCREPANCIES BETWEEN THE PLANS AND THE MANUAL SHALL NOT ALLEVIATE THE CONTRACTOR FROM ADHERING TO THE REQUIREMENTS AS SET FORTH IN THE MANUAL.
E. ADDITIONAL EROSION CONTROL AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED BY THE INSPECTOR.

PLAN NOTES

1. CONSTRUCTION ENTRANCE UTILIZING EXISTING ASPHALT PAVEMENT. CONTRACTOR TO SWEEP AND CLEAN PAVEMENT AS NEEDED TO PREVENT SEDIMENT TRACKING ONTO ADJACENT ROADWAYS.
2. BASKET INLET PROTECTION.

PLAN SYMBOLS

- CONCRETE WASHOUT AREA
- SILT FENCE
- PROPOSED STORM SEWERS
- CONSTRUCTION/GRADING LIMITS
- PROPOSED CONTOURS
- PROPOSED IMPROVEMENTS

0 20 40 FEET
SCALE:1"=20'

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

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STORMWATER POLLUTION PREVENTION PLAN

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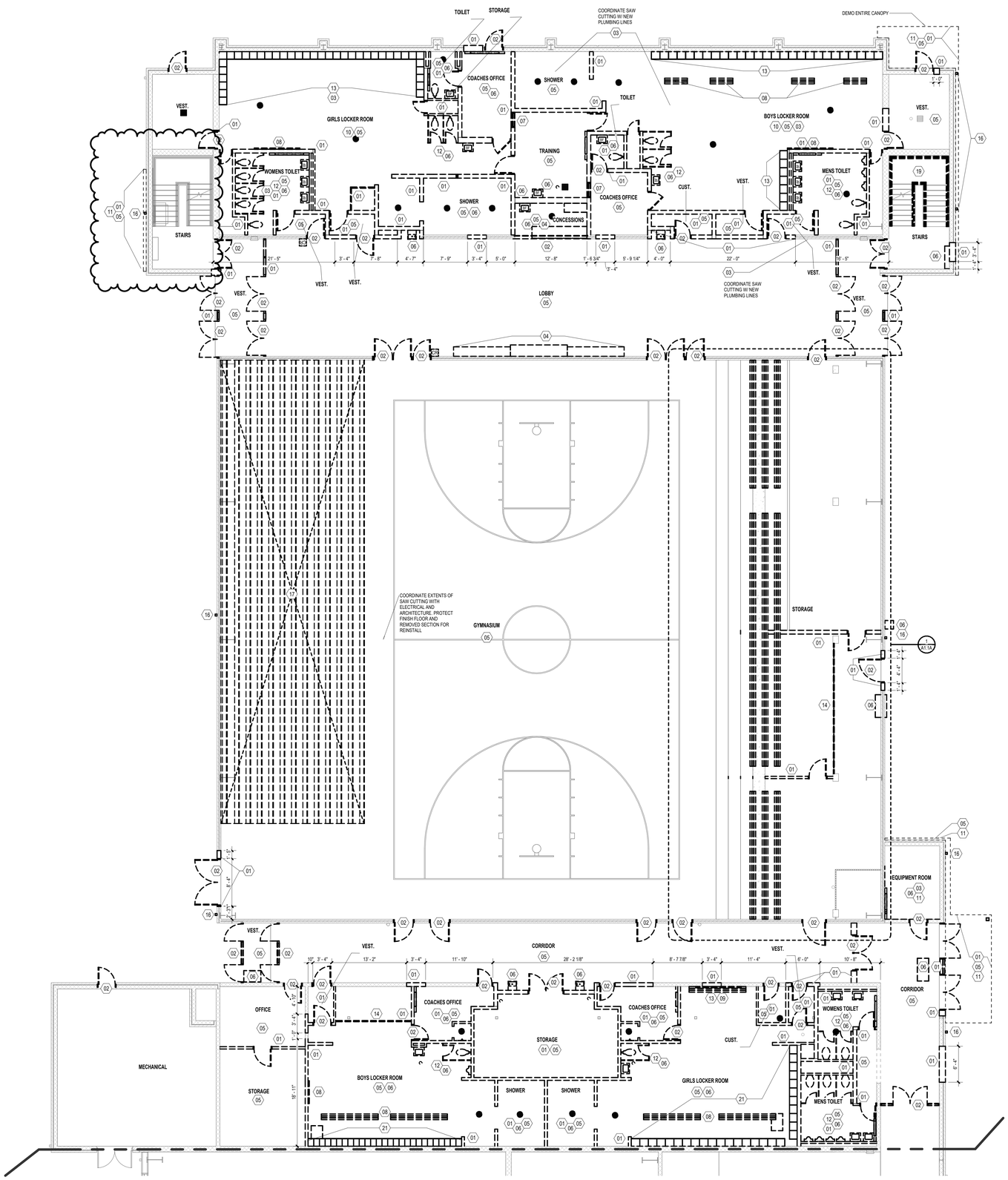


UNIT 'A' FIRST FLOOR DEMOLITION PLAN
1/8" = 1'-0"

DEMOLITION NOTES

- DEMOLITION CONTRACTOR IS TO STOP WORK IMMEDIATELY IN AREA IF ASBESTOS IS ENCOUNTERED. NOTIFY CONSTRUCTION MANAGER OF SUSPECTED AREA SO PROPER ABATEMENT CAN BE DONE. (UNDER A SEPARATE ASBESTOS ABATEMENT CONTRACT AS NEGOTIATED BY OWNER.)
- ALL MASONRY BLOCK AND BRICK WALLS TO BE REMOVED MUST BE TOOTHED TO RECEIVE NEW MASONRY, UNLESS NOTED OTHERWISE ON DRAWINGS.
- DEMOLITION CONTRACTOR IS TO PROVIDE TEMPORARY SHORING AND BRACING FOR EXISTING ROOF/FLOOR STRUCTURE AS REQUIRED UNTIL PERMANENT WALLS & LINTELS ARE INSTALLED. REFER TO STRUCTURAL & ARCHITECTURAL DRAWINGS FOR BEARING CONDITIONS.
- ALL TRADES ARE TO COORDINATE ANY DEMOLITION, CAPPING OR ABANDONMENT OF EXISTING MECHANICAL, ELECTRICAL, PLUMBING OR ARCHITECTURAL ITEMS.
- ALL ITEMS TO BE SAVED AND/OR RELOCATED ARE TO BE STORED IN A PROPER MANNER SO NO DAMAGE WILL OCCUR TO THESE ITEMS DURING THEIR STORAGE PERIOD.
- ALL DEMOLITION WHICH DAMAGES ADJACENT SURFACES IS TO BE REPAIRED TO MATCH THE EXISTING SURFACE DAMAGED (MATERIALS & FINISHES) AND ALL REPAIR WORK IS TO BE COORDINATED WITH NEW CONSTRUCTION. FOR NEW OPENINGS IN EXISTING WALLS, COORDINATE NEW LINTELS W/ MASONRY CONTRACTOR.
- PATCH WALLS & ROOF TO MATCH EXISTING CONSTRUCTION BEHIND REMOVAL OF WALL LOUVERS, EXHAUST FANS, INTAKE HOODS & CABINET HEATERS. VERIFY SEQUENCE OF REMOVAL W/ CONSTRUCTION MANAGER. SEE MECHANICAL AND ELECTRICAL DEMOLITION SHEETS FOR WALL, ROOF & FLOOR OPENINGS TO BE PATCHED.
- ALL TRADES ARE TO COORDINATE THE REMOVAL OF EXISTING LOOSE EQUIPMENT WITH ARCHITECT AND/OR OWNER. ADDITIONAL EQUIPMENT FOUND THAT IS NOT NOTED ON DEMOLITION PLAN SHALL BE REMOVED AS PART OF GENERAL DEMOLITION AFTER VERIFICATION WITH ARCHITECT/OWNER.

01 REMOVE EXISTING WALL INCLUDING DOORS, WINDOWS, BORROWED LITES, AND ANY EQUIPMENT OR FURNISHINGS ATTACHED TO WALL OR PORTION OF EXISTING WALL AS SHOWN ON FLOOR PLAN (MIN. 4" BELOW FLOOR SLAB) AND AS REQUIRED FOR NEW CONSTRUCTION. FLOOR SURFACE TO BE PATCHED AS REQUIRED TO RECEIVE NEW FLOOR MATERIAL. WALL SURFACE TO BE PATCHED AS REQUIRED TO RECEIVE NEW WALL FINISH. SEE MECHANICAL & ELECTRICAL DEMOLITION NOTES FOR RELATED ITEMS. SUPPORT UNBRACED SECTIONS OF WALL OR ROOF AS REQUIRED.

02 REMOVE EXISTING BORROWED LITE OR DOOR & DOOR FRAME. (DOOR LINTEL TO REMAIN UNLESS OTHERWISE NOTED ON PLAN - SEE STRUCTURAL FOR ADDITIONAL INFORMATION). WHERE DOOR FRAMES ARE TO REMAIN, PROTECT FRAMES FROM DAMAGE. SAND AND PREP FOR NEW PAINT FINISH UNDER SECTION 09 90 00. SEE DOOR SCHEDULE FOR REQUIRED NEW DOORS AND FRAMES OR ONLY NEW DOORS.

03 SAW CUT AND REMOVE FLOOR OR PORTION OF EXISTING FLOOR SLAB AS SHOWN OR DIMENSIONED ON FLOOR PLAN. EXCAVATE, FILL & COMPACT SOIL AS REQUIRED FOR NEW SLAB- COORDINATE WITH MECHANICAL/ ELECTRICAL DEMOLITION NOTES FOR RELATED ITEMS & LOCATIONS. INSTALL NEW SLAB TO MATCH EXISTING ELEVATION. SEE STRUCTURAL FOR ADDITIONAL INFORMATION REGARDING SLAB REMOVAL.

04 REMOVE EXISTING CASEWORK/MILLWORK, COUNTER TOPS & BACK SPLASH. SAVE ITEMS AT OWNER'S REQUEST.

05 REMOVE EXISTING SUSPENDED/PLASTER CEILING - INCLUDING ALL FRAMING, TILES, TEES, HANGERS & WIRES USED TO SUPPORT THAT CEILING. REPLACE PER REFL. CEILING PLANS.

06 SEE MECHANICAL DEMOLITION NOTES FOR REMOVAL OF EXIST. PLUMBING/MECHANICAL (i.e. LAVATORIES, SINKS, WATER CLOSETS, URINALS, FIN TUBE, MECH. DUCTWORK, UNIT VENTS, ETC.)

07 REMOVE EXISTING WINDOW. WINDOW WALL WITH ALUMINUM FRAMING WITH METAL PANELS BELOW WINDOW. FRAME, SILL & GLAZING INCLUDING ALL EXISTING WOOD BLOCKING AND FRAMING ABOVE WINDOWS TO ROOF AND/OR MASONRY TIES AT BRICK PIERS AND SIDE WALLS.

08 REMOVE EXISTING EQUIPMENT OR FURNISHINGS SECURED TO FLOOR, WALL OR CEILING AND STORE FOR REUSE BY OWNER.

09 REMOVE EXISTING CHALK, TACK OR WHITE BOARD. REMOVE ALL GLUE RESIDUE, ETC. FROM BLOCK BEHIND BOARD AND PREPARE SURFACE FOR NEW FINISH MATERIALS WHERE REQUIRED.

10 REMOVE EXISTING FLOOR COVERING AND BASE, INCLUDING ALL GLUE RESIDUE, MUDBEDS, ETC. FROM FLOORS & WALLS AND PREPARE SURFACE FOR NEW FINISH MATERIALS, INCLUDING GRINDING, PATCHING AND/OR SELF-LEVELING COMPOUND AS REQUIRED. WALL & FLOOR SURFACE TO RECEIVE NEW FINISH MATERIAL & PATCH TO MATCH EXISTING.

11 REMOVE PORTION OF EXISTING ROOF & STRUCTURE (AS SHOWN ON DEMOLITION PLAN). PROVIDE TEMPORARY WEATHER PROTECTION AS NEEDED AROUND PERIMETER OF ROOF REMOVAL AS REQUIRED. PROVIDE TEMPORARY SHORING & BRACING AS REQUIRED.

12 REMOVE EXISTING TOILET PARTITION. DISPENSERS AND/OR TOILET ACCESSORIES AND REPAIR ADJACENT SURFACES TO RECEIVE NEW FINISHES.

13 REMOVE EXISTING LOCKERS AND LOCKER BASE. CUT SLOPED LOCKER TOP & BASE AS NECESSARY. RE-USE/RELOCATE EXISTING END PANEL(S) AS REQUIRED. REVISE & PREPARE FOR NEW FINISHES.

14 REMOVE FENCE AND PREP AFFECTED FLOORS AND WALLS FOR NEW FINISHES. SAVE ITEMS AT OWNER'S REQUEST.

15 REMOVE EXISTING WINDOW BLINDS. PREP AFFECTED WALLS FOR NEW FINISHES.

16 REMOVE DOWNSPOUT. CLEAN ADJACENT BRICK.

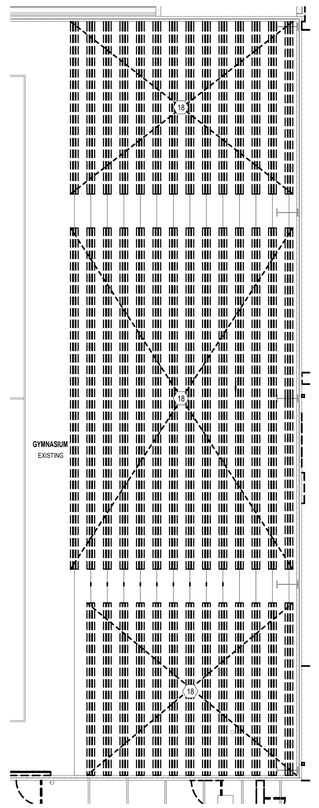
17 REMOVE EXISTING BLEACHER STRUCTURE.

18 REMOVE EXISTING BLEACHER BENCH, AND OTHER FURNISHING ATTACHED TO CONCRETE BLEACHERS. SAVE ITEMS AT OWNER'S REQUEST. PREP FOR INSTALLATION OF NEW BENCHES

19 REMOVE EXISTING RAILING, AND EQUIPMENT ATTACHED TO RAILING AND PREP FOR NEW RAILING AND EQUIPMENT

20 REMOVE AND REPLACE DAMAGED CEILING TILES.

21 REMOVE EXISTING LOCKERS AND ACCESSORIES FOR NEW FINISH AND RE-INSTALLATION. REFER TO ENLARGED FLOOR PLANS FOR ADDITIONAL INFORMATION



1 A1.1A BLEACHER DEMOLITION PLAN
1/8" = 1'-0"

DEMOLITION LEGEND

- EXISTING WALL TO BE DEMOLISHED
- PORTION OF EXISTING WALL TO BE DEMOLISHED
- EXISTING OBJECT TO BE DEMOLISHED
- AREA OF FLOOR CUTTING
- AREA OF CEILING REMOVAL AND REINSTALL
- EXISTING WALLS TO REMAIN
- EXISTING OBJECTS TO REMAIN
- (XX) DEMOLITION TAG: SEE DEMOLITION NOTES
- ROOM NAME / FLOOR FINISH / CEILING FINISH — EXISTING ROOM FINISH INFORMATION: ROOM NAME, FLOORING TYPE, CEILING TYPE

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.16.2025 ADDENDUM 001
01.22.2025 ADDENDUM 002

DRAWN JHB
REVIEWED AGS

PROJECT NO. 5-6394

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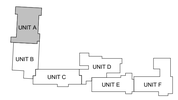

KEYPLAN

UNIT 'A' FIRST FLOOR DEMOLITION PLAN

A1.1A

Autodesk Docs://5-6394 Western Wayne Schools Additions & Renovations/5-6394A 2022.rvt
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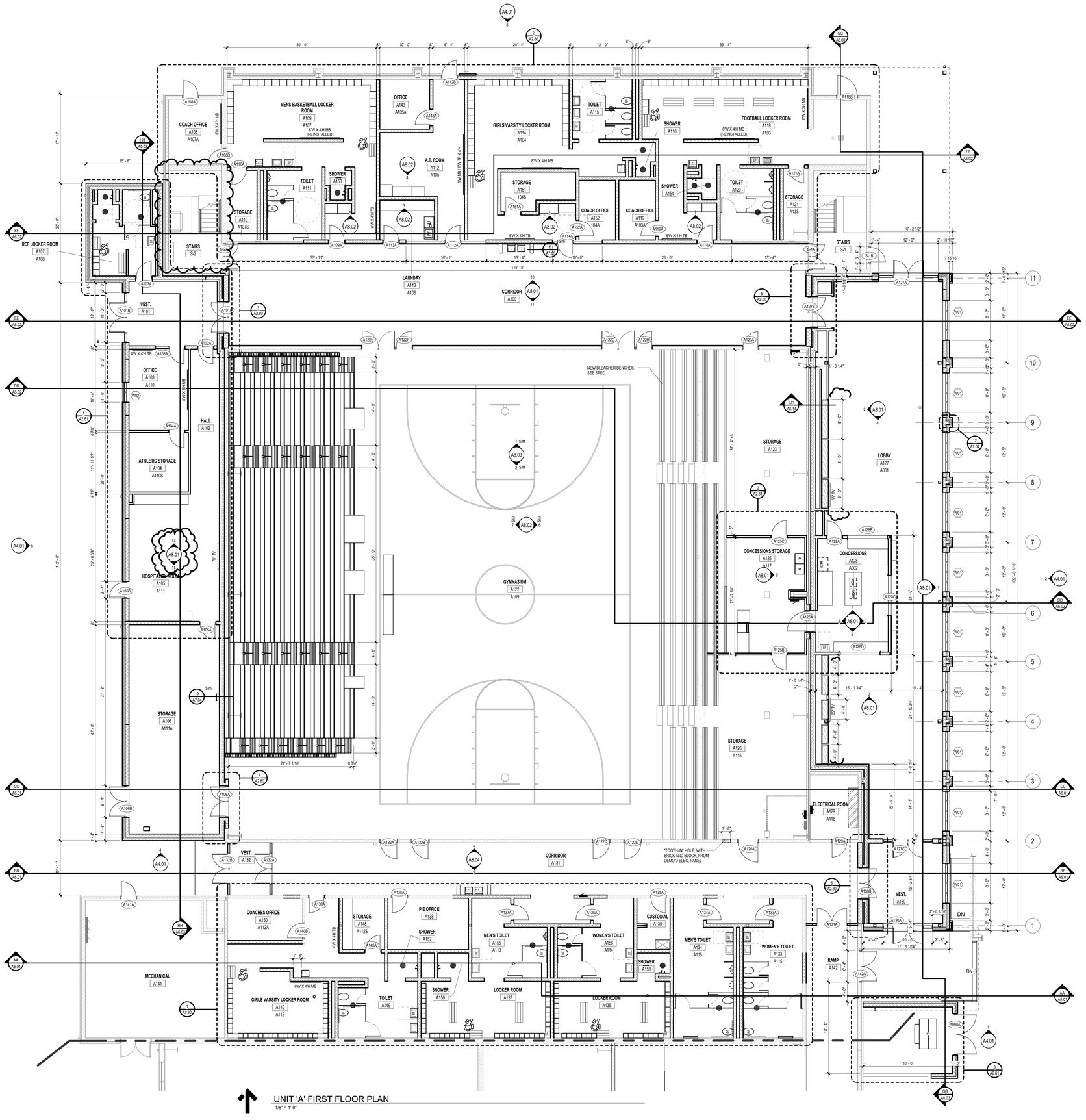

UNIT 'A' FIRST FLOOR PLAN

1/8" = 1'-0"

GENERAL FLOOR PLAN NOTES:

1. DIMENSIONS GIVEN ARE TO THE FACE OF MASONRY UNITS OR TO THE FINISHED FACE OF METAL STUD PARTITION WALLS.
2. REFERENCE STRUCTURAL DRAWINGS FOR CONCRETE SLAB SIZES AND SLAB RELATED INFORMATION.
3. INTERIOR STUD WALLS ARE TO USE 3 5/8" METAL STUD FRAMING UNLESS OTHERWISE NOTED.
4. TURN UP VAPOR RETARDER MATERIAL AT JOINTS BETWEEN FLOOR SLAB AND FOUNDATION WALL UNLESS NOTED OTHERWISE.
5. SEE FOUNDATION PLANS FOR FLOOR SLAB RECESSES FOR TILE, WOOD FLOOR, ETC. (VERIFY RECESS REQUIRED BY MFR.)
6. EXTEND ALL INTERIOR WALL PARTITIONS (MASONRY OR STUDS) TO BOTTOM OF DECK ABOVE UNLESS NOTED OTHERWISE.
7. REFERENCE STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL FOR ITEMS NOT SHOWN. COORDINATE AS REQUIRED INCLUDING NECESSARY FRAMING, BLOCKING, ETC.
8. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF ANY CABINETRY, FRAMES, STRUCTURAL ITEMS, ETC.
9. PROVIDE PAINTED ACCESS PANELS IN WALLS AND CEILINGS TO PROVIDE ACCESS TO CONCEALED ITEMS INCLUDING BUT NOT LIMITED TO VALVES, CONTROLS, MECH. EQUIPMENT, ETC. ACCESS PANELS MAY NOT ALWAYS BE SHOWN ON PLANS. IT IS THE SUB CONTRACTOR RESPONSIBILITY TO DETERMINE LOCATIONS. COORDINATE LOCATIONS WITH OTHER GENERAL CONTRACTOR / SITE SUPERVISOR.
10. COORDINATE WALLS WITH COLUMNS AND OTHER ENCASED ITEMS. COLUMNS ARE TO BE CONTAINED WITHIN WALLS. THE FRAMING CONTRACTOR SHALL INCREASE FRAMING SIZE TO ACCOMMODATE COLUMNS, DRAIN LEADERS, PIPING, ELECTRICAL PANELS, ETC. WHERE WALLS REQUIRE EXTRA WIDTH THE ENTIRE WALL SHALL BE WIDENED UNLESS APPROVED BY ARCHITECT.
11. ALL GUARDRAILS AND HANDRAILS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE 2015 M.B.C., ANSI ICC A117.1-2009 & AMERICANS WITH DISABILITIES ACT GUIDELINES. THE MOST STRINGENT SHALL PREVAIL.
12. PROVIDE MINIMUM CLEARANCES AT ALL DOORS PER DETAILS. SEE G0.01 FOR REQUIREMENTS.
13. FOR ALL CABINETRY, SEE INTERIOR ELEVATIONS FOR LAYOUTS. FIELD VERIFY CLEAR WIDTHS PRIOR TO FABRICATION.
14. ALL EXTERIOR BLOCK CORNERS ARE TO BE BULLNOSE BLOCK EXCEPT CONCRETE BLOCK COLUMNS, PIERS AND WALLS TO RECEIVE TILE - UNLESS NOTED OTHERWISE
15. CONTRACTOR TO MAINTAIN / REPAIR RATING OF EXISTING PARTITIONS AS AFFECTED BY DEMOLITION / NEW CONSTRUCTION. TYPICAL THROUGHOUT.
16. SEAL ALL PENETRATIONS IN FIRE RATED FLOORS AND WALLS WITH APPROVED FIRESTOPPING.
17. WHERE SPECIALTY BLOCK IS REQUIRED AT THE SAME HEIGHT ON BOTH SIDES OF A WALL USE (2) SPECIALTY BLOCKS BACK TO BACK TO MAINTAIN THE FINISHED WALL APPEARANCE BOTH SIDES OF THE WALL. COORDINATE WITH STRUCTURAL FOR LINTELS CONDITIONS PER SPECIFICATIONS.
18. WALLS TO BE PATCHED WITH LIKE MATERIALS WHERE EXISTING WALLS HAVE BEEN COMPROMISED FROM DEMOLITION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO REMOVAL AND REINSTALLATION OF CASEWORK AND WALL MOUNTED EQUIPMENT IN ORDER TO ACHIEVE SAID PATCH. IN AREAS WHERE BLOCK OR BRICK HAVE BEEN USED, NEW MASONRY TO BE TOOTHED IN AND MATCH EXISTING. AREAS AND FINISHES IN QUESTION SHALL BE COORDINATED WITH ARCHITECT.
19. SEE STRUCTURAL FRAMING PLANS FOR ADDITIONAL WALL REINFORCING REQUIREMENTS. MINIMUM REINFORCING (FOR ALL WALLS NOT OTHERWISE NOTED ON STRUCTURAL PLANS):
    A. ALL BEARING WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.
    B. ALL EXTERIOR WALLS SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.
    C. ALL INTERIOR NON-BEARING WALLS OVER 16'-0" HIGH SHALL RECEIVE A MINIMUM REINFORCING OF R1-5-48.

WALL LEGEND

- 4 7/8" — 5/8" GYP. BOARD BOTH SIDES 3 5/8" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT. FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
- 5 5/8" — 2 LAYERS OF 5/8" GYP. BOARD BOTH SIDES 3 5/8" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
- 1 1/4" — 5/8" GYP. BOARD BOTH SIDES 6" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT. FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
- SEE PLAN — CMU WALL SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN (8" TYPICAL U.N.O.)
- SEE PLAN — BRICK AND CMU WALL W/ 2" SPRAY APPLIED INSULATION SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN. SEE WALL SECTIONS FOR ADDITIONAL DETAILS, BANDING, ETC. (3 5/8" BRICK & 8" CMU TYPICAL U.N.O.)
- 1' - 0 1/4" — CMU WALL W/ GYP. BD. ON 3 5/8" MTL STUDS. SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN. SEE WALL SECTIONS FOR ADDITIONAL DETAILS, BANDING, ETC. (8" CMU TYPICAL U.N.O.)
- 10 1/8" — CMU WALL W/ 5/8" GYP. BOARD ON 1 1/2" HAT CHANNEL. SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN.
- 2 1/8" OR 1 1/2" — 5/8" GYP. BOARD ON HAT CHANNEL REPEATING AT 16" O.C.

-FIRE RATINGS AS CALLED FOR ON CODE COMPLIANCE PLAN

-DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF CMU OR GYPSUM WALL BOARD UNLESS NOTED OTHERWISE

FLOOR PLAN KEYNOTES

01 TOOTH-IN NEW CMU AND OR BRICK

02 INFILL WITH GYP. & MTL. STUDS

03 4' - 0" TALL BLOCK WALL

KEYPLAN

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.22.2025 ADDENDUM 002

DRAWN JHB
REVIEWED AGS

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UNIT 'A' FIRST FLOOR PLAN

A2.1A

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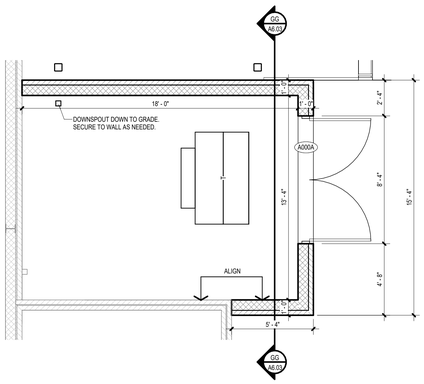
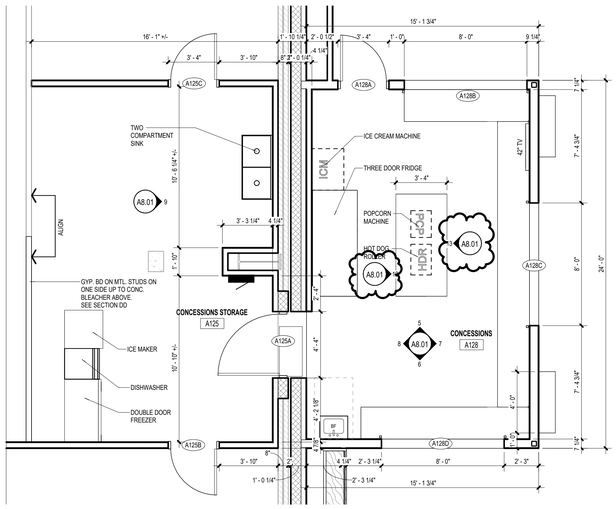


3 / A2.81 ENCLOSURE ENLARGED PLAN
1/4" = 1'-0"



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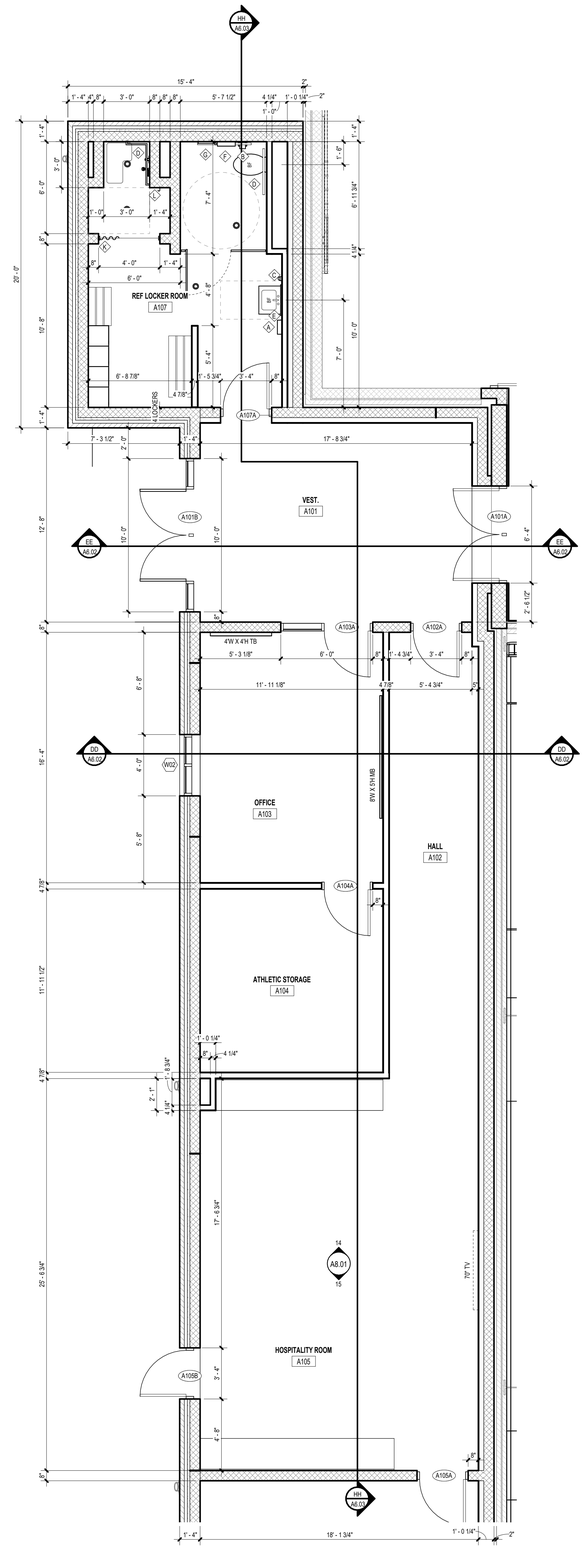
1/4" = 1'-0"



1 / A2.81 UNIT 'A' OFFICE AREA ENLARGED PLAN
1/4" = 1'-0"

WALL LEGEND

4 7/8"	5/8" GYP. BOARD BOTH SIDES 3 5/8" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
6 1/8"	2 LAYERS OF 5/8" GYP. BOARD BOTH SIDES 3 5/8" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
7 1/4"	5/8" GYP. BOARD BOTH SIDES 6" LIGHT GA. METAL FRAMING AT 16" O.C. SOUND BATT FULL HEIGHT OF WALL. WALLS TO BOTTOM OF DECK UNLESS NOTED OTHERWISE
SEE PLAN	CMU WALL SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN (8" TYPICAL U.N.O.)
SEE PLAN	BRICK AND CMU WALL W/ 2" SPRAY APPLIED INSULATION SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN. SEE WALL SECTIONS FOR ADDITIONAL DETAILS, BANDING, ETC. (3 5/8" BRICK & 8" CMU TYPICAL U.N.O.)
5 1/4"	CMU WALL W/ GYP. BD. ON 3 5/8" MTL STUDS. SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN. SEE WALL SECTIONS FOR ADDITIONAL DETAILS, BANDING, ETC. (8" CMU TYPICAL U.N.O.)
10 1/8"	CMU WALL W/ 5/8" GYP. BOARD ON 1 1/2" HAT CHANNEL. SEE FLOOR PLANS FOR REQUIRED WALL REINFORCING. NOMINAL DIMENSIONS GIVEN.
2 7/8" OR 1 1/2"	5/8" GYP. BOARD ON HAT CHANNEL REPEATING AT 16" O.C.

-FIRE RATINGS AS CALLED FOR ON CODE COMPLIANCE PLAN

-DIMENSIONS GIVEN ARE TO THE FINISHED FACE OF CMU OR GYPSUM WALL BOARD UNLESS NOTED OTHERWISE

TOILET ACCESSORIES LEGEND

(SEE SHEET G0.01 FOR MOUNTING HEIGHTS)
(SEE SPECS)

A PAPER TOWEL DISPENSER	G NAPKIN DISPOSAL (RECESSED)
B TOILET PAPER DISPENSER	H NAPKIN DISPOSAL (WALL MOUNTED)
C SOAP DISPENSER	J BABY CHANGING STATION
D BARRIER FREE GRAB BARS	K SHOWER ROD AND CURTAIN
E 24" x 36" FRAMED GLASS MIRROR	L ROBE HOOK
F NAPKIN DISPENSER (WALL MOUNTED)	M 18" X 36" FRAMED GLASS MIRROR

FLOOR PLAN KEYNOTES

01	TOOTH-IN NEW CMU AND OR BRICK
02	INFILL WITH GYP. & MTL. STUDS
03	4' - 0" TALL BLOCK WALL

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.16.2025 ADDENDUM 001
01.22.2025 ADDENDUM 002

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ENLARGED PLANS

A2.81

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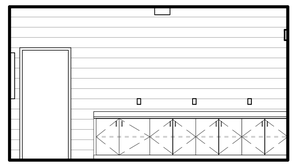
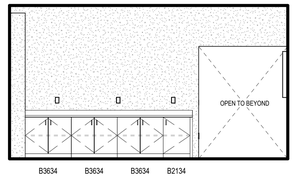
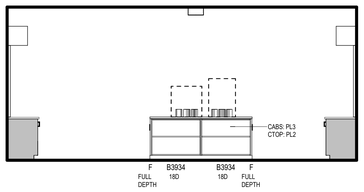


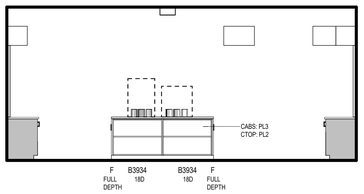
15 A8.01 A105 HOSPITALITY ROOM SOUTH ELEVATION
1/4" = 1'-0"



14 A8.01 A105 HOSPITALITY ROOM NORTH ELEVATION
1/4" = 1'-0"



13 A8.01 A128 CONCESSION ISLAND WEST ELEVATION
1/4" = 1'-0"



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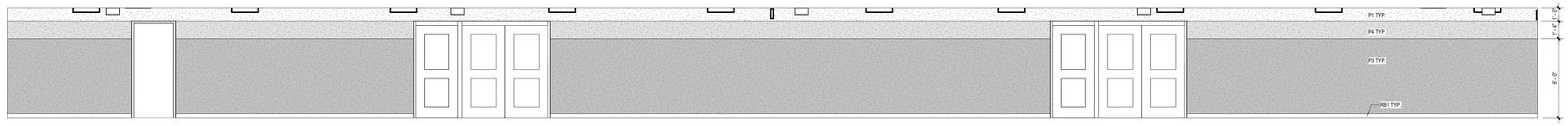
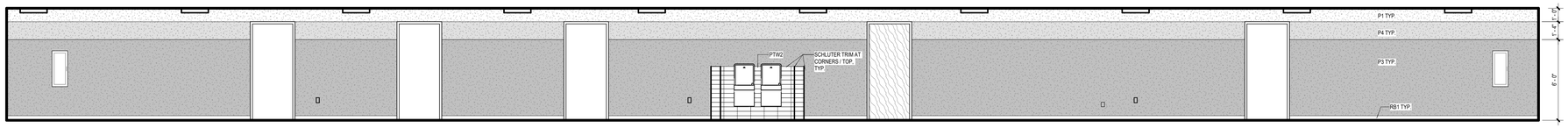


11 A8.01 A100 LOBBY SOUTH ELEVATION
1/4" = 1'-0"



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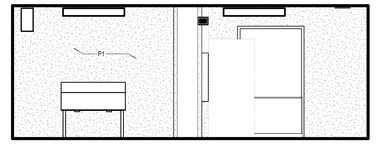

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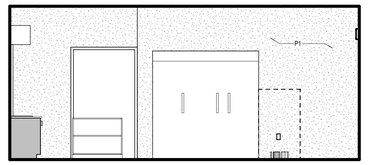

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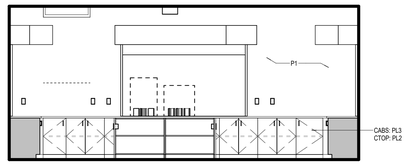

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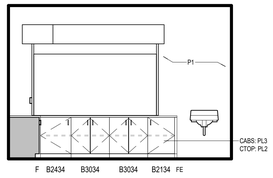
1/4" = 1'-0"



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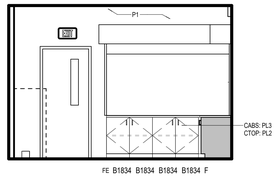

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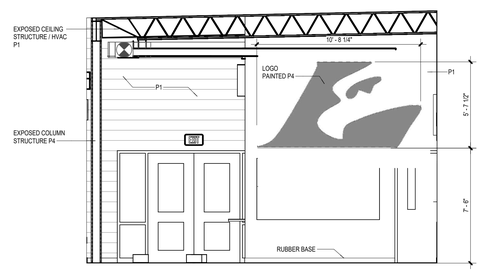
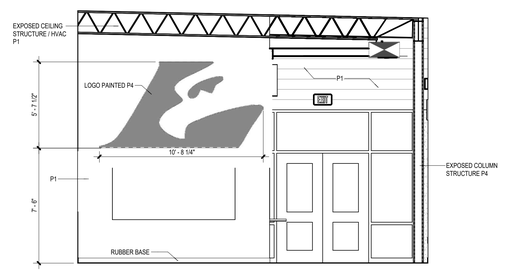
1/4" = 1'-0"



4 A8.01 A127 LOBBY SOUTH ELEVATION
1/4" = 1'-0"



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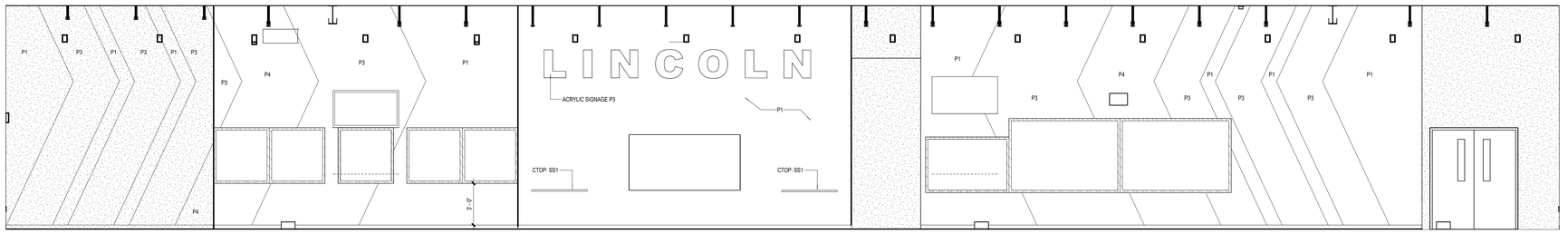

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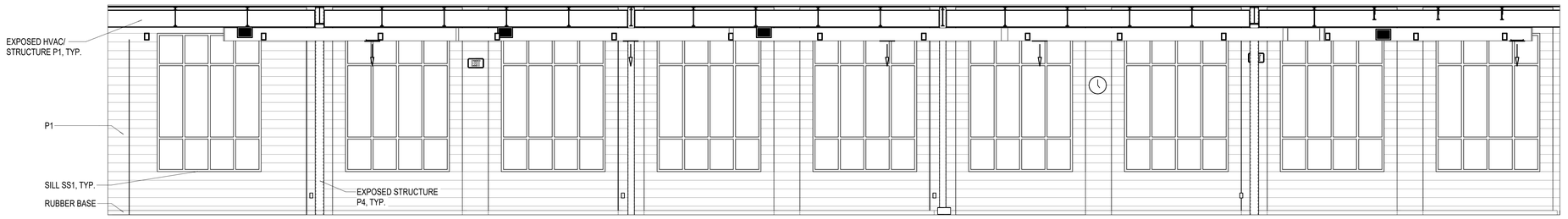

1 A8.01 A127 LOBBY EAST ELEVATION
1/4" = 1'-0"

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION

01.22.2025 ADDENDUM 002

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INTERIOR ELEVATIONS

A8.01

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	MECHANICAL KEYNOTE LEGEND
01	NEW EXHAUST FAN ON ROOF ABOVE. SEAL ROOF PENETRATION WATER-TIGHT. CONNECT TO EXISTING BAS.
02	NEW BLOWER COIL UNIT. SUPPORT FROM STRUCTURE ABOVE. SUSPEND AS HIGH AS POSSIBLE. CONNECT TO EXISTING BAS.
03	NEW CEILING MOUNTED HHW CABINET UNIT HEATER. EXTEND 3/4" HHW PIPING AS NECESSARY. CONNECT INTO EXISTING BAS.
04	INSTALL NEW SIDEWALL EXHAUST FAN REUSING EXISTING SIDEWALL PENETRATION LOCATION.
05	INSTALL INDOOR MINI-SPLIT UNIT. ROUTE CONDENSATE PIPING TO NEAREST FLOOR DRAIN OR MOP SINK WITH APPROPRIATE SLOPING.
06	INSTALL NEW OUTDOOR MINI-SPLIT ON ROOF ABOVE.
07	INSTALL NEW OUTDOOR SPLIT UNIT MOUNTED TO EXTERIOR WALL. PROVIDE BRACKET FOR INSTALLATION.
08	INSTALL NEW INTAKE VENTILATOR ON ROOF ABOVE. SEAL ROOF PENETRATION WATER-TIGHT. CONNECT TO EXISTING BAS.
09	INSTALL HHW UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. PROVIDE CONTROLS AND CONNECT INTO BAS.
10	WASHER AND DRYER OWNER PROVIDED. COORDINATE FINAL EQUIPMENT SELECTION AND LOCATION WITH OWNER. EXHAUST DUCT TO BE SIZED AND INSTALLED PER MFGR IOM AND IMC SECTION 504. WHERE A CLOTHES DRYER EXHAUST DUCT PENETRATES A WALL OR CEILING MEMBRANE, THE ANNULAR SPACE SHALL BE SEALED WITH NONCOMBUSTIBLE MATERIAL, APPROVED FIRE CAULK OR NONCOMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE. EACH DRYER DUCT VERTICAL RISER SHALL BE PROVIDED WITH A MEANS FOR CLEANOUT. DRYER EXHAUST DUCTS SHALL BE SUPPORTED AT FOUR FOOT INTERVALS AND SECURED IN PLACE. THE INSERT END OF THE DUCT SHALL EXTEND INTO THE ADJOINING DUCT OR FITTING IN THE DIRECTION OF AIRFLOW. DUCTS SHALL NOT BE JOINED WITH SCREWS OR SIMILAR FASTENERS THAT PROTRUDE MORE THAN ONE-EIGHTH INCH INTO THE INSIDE OF THE DUCT. ROUTE DRYER DUCT TO CORNER AS SHOWN AND PENETRATE THE ROOF ABOVE. INSTALL WITH GOOSENECK AND BACKDRAFT DAMPER ACCORDING TO MFGR INSTRUCTIONS. CAP DRYER EXHAUST DUCT FOR FUTURE IF EQUIPMENT IS NOT IN PLACE AT TIME OF INSTALL

UNIT 'A' FIRST FLOOR HVAC PLAN

1/8" = 1'-0"

KEYPLAN

UNIT A | UNIT B | UNIT C | UNIT D | UNIT E | UNIT F

gmb

Maze Design, Inc.

WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION

01.22.2025 ADDENDUM 002

DRAWN GSH

REVIEWED LDE

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UNIT 'A' FIRST FLOOR HVAC PLAN

M2.1A

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BLOWER COIL UNIT SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	DISCHARGE	SUPPLY AIR							COOLING COIL												HEATING COIL					FILTRATION		ELECTRICAL					OPER. WEIGHT (LB)	NOTES
					CFM	MIN OA CFM	TSP (in-wg)	ESP (in-wg)	RPM	DRIVE	BHP	MOTOR HP	EAT (DB °F)	EAT (WB °F)	LAT (DB °F)	LAT (WB °F)	FACE VEL (FPM)	APD (“WC)	FLUID TYPE	GPM	EWT (°F)	LWT (°F)	MAX WPD (FT)	ROWS	TOTAL MBH	SENSIBLE MBH	EAT (°F)	LAT (°F)	GPM	EWT (°F)	LWT (°F)	WPD (FT)	TYPE	MERV	DEPTH (IN)	VOLT	PH	MCA	MOP	FLA		
BCU-1A	A100 LOBBY	TRANE	BCVE024	HORIZONTAL	1200	0	2.1	1.5	**1836**	**DIRECT**	**.92**	.97	77	64	54.1	53.4	400	0.5	WATER	7.5 GPM	44	54	8.82	4	18.93	30.27	60	104	2.2	140	88.2	0.9	PLEATED	8	2”	208	3	5.8	15	5	195	1, 2
BCU-3A	HOSPITALITY ROOM	TRANE	BCVE024	HORIZONTAL	700	150	2.1	1.5	**1879**	**DIRECT**	**.52**	.96	77	64	55.6	55	420	0.4	WATER	3.8 GPM	44	54	1.82	4	18.93	16.46	60	104	1.5	140	95.6	0.3	PLEATED	8	2”	208	3	5.8	15	5	190	1, 2
BCU-4A	LOBBY	TRANE	BCVE120	HORIZONTAL	3100	600	2	1.5	**1232**	**DIRECT**	**1.856**	2.8	77	64	54.6	54	406	0.4	WATER	18.3 GPM	44	54	3.21	4	92.03	76.33	60	104	6.2	140	92.4	0.4	PLEATED	8	2”	208	3	14	25	11	505	1, 2

GENERAL REQUIREMENTS:

1. DISCONNECTS WILL MFGR PROVIDED

NOTES:

1. INTEGRATE TO EXISTING BMS SYSTEM.
2. PROVIDE ECM.
3. PROVIDE STAINLESS STEEL CONDENSATE DRAIN PAN WITH WET SWITCH ALARM.

CABINET UNIT HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	CONFIGURATION	INLET	DISCHARGE	CFM	CAPACITY MBH	FLUID TYPE	ROWS	GPM	EWT (°F)	LWT (°F)	MAX. WPD (FT)	ELECTRICAL			NOTES
														VOLT	PH	HZ	
CUH-1	TRANE	FFEB020	HORIZONTAL RECESSED	BOTTOM STAMPED	BOTTOM STAMPED	200	9.66	WATER	2	1.0	135.0	115.0	4.45	208	1	60	1, 2, 3
CUH-2	TRANE	FFEB030	HORIZONTAL RECESSED	BOTTOM STAMPED	BOTTOM STAMPED	400	15.42	WATER	2	1.6	135.0	115.0	10.13	208	1	60	1, 2, 3
CUH-3	TRANE	FFEB060	HORIZONTAL RECESSED	BOTTOM STAMPED	BOTTOM STAMPED	600	25.64	WATER	2	2.6	135.0	115.0	7.68	208	1	60	1, 2, 3

NOTES:

1. CONTROLLED BY BMS.
2. W/ MANUFACTURER PROVIDED 2-WAY CONTROL VALVE.
3. W/ UNIT MOUNTED THERMOSTAT.

UNIT HEATER (HYDRONIC) SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	CFM	HEATING COIL					ELECTRICAL					NOTES
					CAPACITY (MBH)	GPM	H2O DELTA T	LAT (°F)	MAX.WPD (FT)	FLUID TYPE	MOTOR HP	VOLT	PH	HZ	MCA	FLA	
UH-1	STORAGE HEATING	STERLING	HS-036B	550	26.1	2.7	20	103	0.09	WATER	25 W	115	1	60	2	1	1, 2, 3

NOTES:

1. CONTROLLED BY BMS
2. INCLUDE 2-WAY MOTORIZED SHUTOFF VALVE
3. WALL MOUNTED THERMOSTAT

DIFFUSER SCHEDULE

MARK	MODEL	DESCRIPTION	BORDER TYPE	MATERIAL	NECK SIZE	NOTES
EG-1	50F	EGGCRATE EXHAUST GRILLE	LAY-IN	Aluminum - Titus - 26 White	8” X 8”	2
EG-2	350RL	DUCT MOUNTED EXHAUST GRILLE	SURFACE MOUNT	Steel - Titus - 26 White	6”x4”	4
EG-3	50F	EGGCRATE EXHAUST GRILLE	SURFACE MOUNT	Aluminum - Titus - 26 White	8” X 8”	1
R-1	45F	SIGHT PROOF EGGCRATE RETURN GRILLE	LAY-IN	Steel - Titus - 26 White	8” X 8”	<varies>
R-2	45F	SIGHT PROOF EGGCRATE RETURN GRILLE	SURFACE MOUNT	Steel - Titus - 26 White	24”x24”	3
S-1	OMNI	SQUARE PLAQUE DIFFUSER	LAY-IN	Steel - Titus - 26 White	6”ø	3
S-2	OMNI	SQUARE PLAQUE DIFFUSER	LAY-IN	Steel - Titus - 26 White	8”ø	3
S-3	OMNI	SQUARE PLAQUE DIFFUSER	LAY-IN	Steel - Titus - 26 White	10”ø	3
S-4	300RL	DUCT MOUNTED SUPPLY GRILLE	SURFACE MOUNT	Steel - Titus - 26 White	12”x8”	4

GENERAL REQUIREMENTS:

1. MODELS BASED ON TITUS.

NOTES:

1. 12” X 12” MODULE SIZE
2. 24” X 12” MODULE SIZE
3. 24” X 24” MODULE SIZE
4. MOUNT AIR-TIGHT TO DUCT.

FAN SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	TYPE	WHEEL DIA. (IN)	CFM	SONES	ESP (in-wg)	OV (FPM)	RPM	DRIVE	BHP	MOTOR HP	ELECTRICAL			OPER. WEIGHT (LB)	NOTES
														VOLT	PH	HZ		
EF-1	UNIT A SOUTH LOCKER ROOMS	GREENHECK	G-140-VG	ROOFTOP DOWNBLAST	14 5/8	2155	13.8	0.67	1633	1422	Direct	0.59	1	115	1	60	93	1
EF-2	UNIT A SOUTH LOCKER ROOMS	GREENHECK	G-140-VG	ROOFTOP DOWNBLAST	14 5/8	1680	9.1	0.33	1273	1072	Direct	0.25	1	115	1	60	93	1
EF-3	A106 STORAGE	GREENHECK	G-095-VG	ROOFTOP DOWNBLAST	10 7/8	400	4.6	0.25	345	1067	Direct	0.04	1/6	115	1	60	43	1
EF-4	A123 A126 STORAGE/ 128 CONCESSIONS	GREENHECK	G-100-VG	ROOFTOP DOWNBLAST	11 1/8	780	5.9	0.33	867	1179	Direct	0.09	1/4	115	1	60	62	1
EF-5	A107 REF LOCKER ROOM	GREENHECK	CUE-080-VG	SIDEWALL UPBLAST	10 7/8	150	4.3	0.25	375	1083	Direct	0.02	1/10	115	1	60	48	1
EF-6	UNIT A NORTH LOCKER ROOMS	GREENHECK	CUE-160-VG	SIDEWALL UPBLAST	16 5/8	2975	17	0.8	1730	1306	Direct	0.85	2	208	1	60	141	1
EF-7	UNIT A NORTH LOCKER ROOMS	GREENHECK	CUE-140-VG	SIDEWALL UPBLAST	14 5/8	1625	10.4	0.5	945	1154	Direct	0.29	1/2	115	1	60	94	2

GENERAL REQUIREMENTS:

1. PROVIDE FACTORY INSTALLED DISCONNECT
2. PROVIDE GRAVITY BACKDRAFT DAMPERS.
3. BIRDSCREEN.
4. INTEGRATE TO EXISTING BMS.
5. PROVIDE ECM.

NOTES:

1. FAN TO RUN DURING OPERATING HOURS SET AT THE EXISTING BMS. INTERLOCK WITH OCCUPANCY SENSOR IN LARGEST AREA SERVED BY FAN TO ENABLE FAN WHEN OCCUPANCY IS DETECTED.
2. FAN TO RUN CONTINOUS.

SPLIT SYSTEM - INDOOR UNIT SCHEDULE

MARK	MARK	SERVICE	MANUFACTURER	MODEL	CONFIGURATION	FAN DATA	COOLING		ELECTRICAL			OPER. WEIGHT (LB)	NOTES
						CFM	CAPACITY BTUH	REFRIGERANT	VOLT	PH	MCA	FLA	
SSAC	SSAC-1	A112 A.T. ROOM	TRANE	NTXWPH12B112AA	WALL MOUNTED	454	12000	R454B	208	1	1.00	0.65	29	1, 2, 3
SSAC	SSAC-2	A107 REF LOCKER ROOM	TRANE	NTXWPH12B112AA	WALL MOUNTED	454	12000	R454B	208	1	1.00	0.65	29	1, 2, 3
SSAC	SSAC-3	A103 OFFICE	TRANE	TPEADA012IAA70A	DUCTED	494	12000	R454B	208	1	1.45	1.16	58	2, 3, 6

SPLIT SYSTEM - OUTDOOR UNIT SCHEDULE

	UNIT SERVED	MANUFACTURER	MODEL	NOMINAL TONS	COMPRESSOR DATA		EFFICIENCY			ELECTRICAL				OPER. WEIGHT (LB)	NOTES
					TYPE	NUMBER	EER	SEER	HSPF	VOLT	PH	MCA	MOP		
SSCU-1	A112 A.T. LOCKER ROOM	TRANE	NTXSPH12B 112AA	1	TWIN ROTARY	1	13.8	26.3	11.1	208	1	10	15	83	4, 5
SSCU-2	A107 REF LOCKER ROOM	TRANE	NTXSPH12B 112AA	1	TWIN ROTARY	1	13.8	26.3	11.1	208	1	10	15	83	4
SSCU-3	A106 STORAGE	TRANE	NTXSKH12A 112AA	1	TWIN ROTARY	1	14.1	19.3	11	208	1	14	24	129	4

NOTES:

1. INDOOR UNIT SHALL BE WALL-HUNG CONFIGURATION WITH MOUNTING BRACKETS
2. PROVIDE AN INTEGRAL FACTORY CONDENSATE PUMP
3. SPACE TEMPERATURE SENSOR SHALL BE HARD-WIRED
4. OUTDOOR UNIT SHALL BE CAPABLE OF HIGH HEATING CAPACITIES AT LOW OA TEMPERATURES, SIMILAR TO TRANE HYPER HEAT MODELS.
5. OUTDOOR UNIT SHALL BE MOUNTED 4’ ABOVE GRADE ON EXTERIOR WALL.
6. PROVIDE 2 POSITION OA DAMPER TO OPEN WHEN UNIT FAN ENABLES. BALANCE OPEN POSITION TO 25 CFM. IF CFM CANNOT BE OBTAINED OR DAMPER POSITION CAUSES NOTICIBLE NOISE IN SPACE, CONTACT ENGINEER. OA DAMPER TO CLOSE WHEN UNIT IS DISABLED.

VENTILATOR (INTAKE) SCHEDULE

MARK	MARK	SERVICE	MANUFACTURER	MODEL	TYPE	CFM	THROAT VELOCITY (FPM)	THROAT		APD (in-wg)	DAMPER	OPER. WEIGHT (LB)	NOTES
								SIZE (IN x IN)	AREA (SQ FT)				
IV	IV-1A	SSAC-3 VENTILATION AIR	GREENHECK	GRSI-8	GRAVITY	100	270	8	.4	.013	GRAVITY	20	1, 2, 3, 4
IV	IV-3A	BC-3A VENTILATION AIR	GREENHECK	GRSI-8	GRAVITY	180	500	8	.4	.041	GRAVITY	20	1, 2, 3, 4
IV	IV-4A	BC-4A VENTILATION AIR	GREENHECK	GRSI-16	GRAVITY	600	500	16	1.5	.026	GRAVITY	30	1, 2, 3, 4

GENERAL REQUIREMENTS:

1. CONTRACTOR SHALL VERIFY DUCTWORK CONNECTION SIZES AND COORDINATE LOCATION PRIOR TO ORDERING.
2. SEAL ROOF PENETRATION WATER-TIGHT.

NOTES:

1. BIRDSCREEN
2. 24” PRE-INSULATED ROOF CURB TO MATCH ROOF SLOPE
3. BACKDRAFT DAMPER
4. ANTI-CONDENSATE COATING

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WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.16.2025 ADDENDUM 001
01.22.2025 ADDENDUM 002

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MECHANICAL SCHEDULES

M9.01

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. ALL GENERAL-USE 15- AND 20-AMPERE, 125- AND 250-VOLT NON-LOCKING RECEPTACLES SHALL BE TAMPER-RESISTANT TYPE; REFER TO NEC 406.12 AND SPECIFICATION SECTION 26 27 26.
4. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR LOCATIONS AND QUANTITIES OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
7. PROVIDE INFRASTRUCTURE ONLY FOR COMMUNICATIONS, ACCESS CONTROL, AND FIRE ALARM SYSTEMS. DEVICES SHOWN TO PROVIDE QUANTITIES ONLY. COORDINATE FINAL LOCATIONS OF ALL DEVICES WITH INSTALLER PRIOR TO ROUGH-IN.

ELECTRICAL KEYNOTES

P01	COORDINATE WITH THE LOCAL UTILITY TO INSTALL THE RELOCATED EXISTING UTILITY TRANSFORMER. PROVIDE NEW SECONDARY FEEDERS FROM TRANSFORMER TO SWITCHBOARD 'SB1'.
P02	PROVIDE NEW SWITCHBOARD TO REPLACE THE EXISTING SWITCHBOARD 'MPP'. EXTEND EXISTING FEEDERS AS NECESSARY TO TERMINATE AT NEW SWITCHBOARD.
P03	MOUNT RECEPTACLES IN CASEWORK.
P04	REPLACE ALL RECEPTACLES AND FACEPLATES IN GYMNASIUM WITH NEW DEVICES
P05	MOUNT RECEPTACLES BEHIND EX. TELECOMMUNICATIONS RACK WHERE DIRECTED BY THE OWNER.
P08	POWER SUPPLY FOR BLEACHERS. CONFIRM POWER REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ROUGH-IN.
P09	POWER SUPPLY AND COMMUNICATIONS ROUGH-IN FOR SCOREBOARD. CONFIRM POWER REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ROUGH-IN.
P10	POWER FOR MOTORIZED BASKETBALL BACKBOARD. CONFIRM POWER REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ROUGH. MOUNT DISCONNECT TO STRUCTURE ADJACENT TO MOTOR. CIRCUIT HOMERUN THROUGH WALL CONTROLS. INSTALL CONTROLS WHERE DIRECTED BY OWNER.
P11	MOUNT RECEPTACLE ON PLATFORM ABOVE BLEACHERS.
P12	PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ABOVE CEILING WERE ACCESSIBLE FOR ALL CABINET UNIT HEATERS. INSTALL SWITCH ADJACENT TO EQUIPMENT WHERE POSSIBLE. PROVIDE 5A FUSE. CONFIRM FUSE SIZE WITH FINAL APPROVED MANUFACTURER.
P13	MOUNT DISCONNECT SWITCH ON ROOF ADJACENT TO EQUIPMENT.
P14	MOUNT DISCONNECT SWITCH ON WALL ADJACENT TO EQUIPMENT.
P15	SOUND SYSTEM RACK LOCATION. CONFIRM WITH OWNER PRIOR TO ROUGH-IN.
P16	FOR FLOORBOXES, BORE CONDUIT TO SOUND SYSTEM RACK LOCATION. DO NOT CUT FLOOR WITHOUT PRIOR CONSENT FROM OWNER.

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"

KEYPLAN

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WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

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UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A

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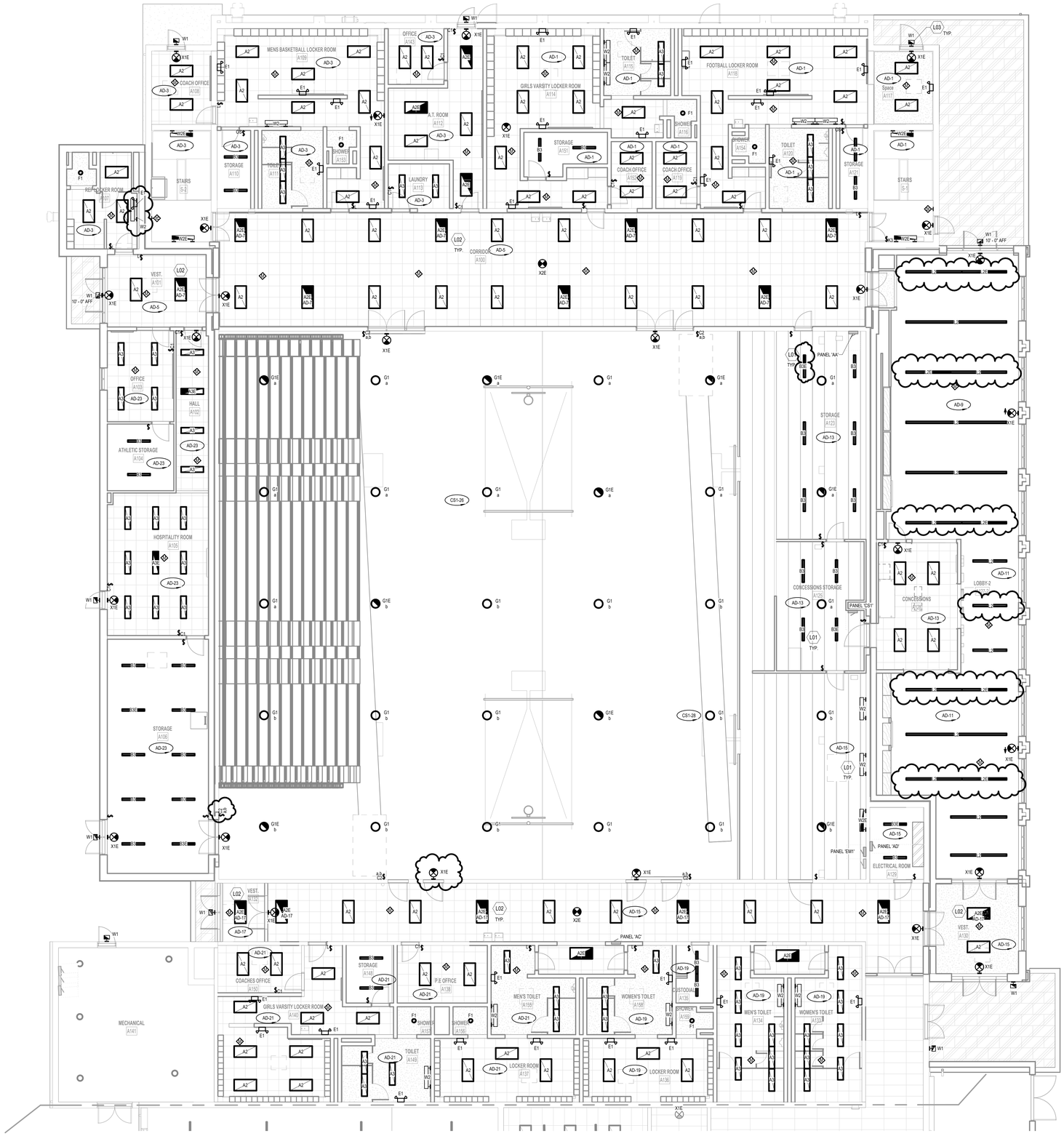

UNIT 'A' FIRST FLOOR LIGHTING PLAN

1/8" = 1'-0"

LIGHTING GENERAL NOTES

---------- DAYLIGHTING AREA - PRIMARY

– – – – – – DAYLIGHTING AREA - SECONDARY

LIGHTING TAG - TYPICAL

B2 — FIXTURE TYPE
A1 — DAYLIGHTING AREA
SWITCHING ZONE / CONTROL CHANNEL

LIGHTING TAG - WITH SPACE I.D.

C4 — FIXTURE TYPE
A101.a1 — DAYLIGHTING AREA
SPACE I.D. / SWITCHING ZONE / CONTROL CHANNEL

1. EACH CONTROL TAG (a, a1, b1, A101.a1, ETC.) REPRESENTS BOTH THE SWITCHING ZONES AND DAYLIGHTING REQUIREMENTS OF THE SPACE AND SHALL BE TREATED AS ONE CONTROL CHANNEL RELATIVE TO THE CONTROL SYSTEM.
2. DAYLIGHTING CONTROLS ARE NOT REQUIRED BY APPLICABLE ENERGY CODE IN SPACES WHERE DAYLIGHTING AREAS ARE NOT SHOWN.
3. LIGHTING CONTROL INTENT NARRATIVE TAGS (CIN:__) ARE PLACED WITHIN SPACES FOR REFERENCE TO LIGHTING CONTROL SCHEDULES.
4. ALL DIMMING CAPABLE LIGHTING FIXTURES (AS NOTED ON LIGHTING FIXTURE SCHEDULE) SHALL BE WIRED AS SUCH WITH 0-10VDC CONTROL WIRING BACK TO CONTROL DEVICE WALL BOX OR LIGHTING CONTROL PANEL WHETHER OR NOT DIMMING CONTROL DEVICE IS REQUIRED.
5. ALL MODULAR LIGHTING CONTROL DEVICES SHALL BE LOCATED WITHIN THE SAME ROOM AS THE CONTROLLED LIGHTING AND IN A CONSISTENT MANNER FROM ROOM-TO-ROOM. PREFERRED LOCATION IS ABOVE ACCESSIBLE CEILING NEAR THE PRIMARY ENTRY DOOR TO THE SPACE IF NO OTHER LOCATION IS SPECIFIED.
6. LIGHTING CONTROL SWITCH AND CONTROL MODULE / POWER PACK SYMBOLS ARE INDICATED FOR REPRESENTATIVE PLACEMENT PURPOSES ONLY AND MAY NOT REFLECT EXACT QUANTITY, SIZE, OR ARRANGEMENT OF BOX(ES) OR DEVICE(S) REQUIRED.
   A. LIGHTING CONTROLS MANUFACTURER SHALL DETERMINE AND FURNISH PRODUCT LAYOUT/APPLICATION DETAIL AS NECESSARY TO ACHIEVE REQUIRED FUNCTIONALITY AS IDENTIFIED IN SPECIFICATIONS AND ON LIGHTING CONTROL SCHEDULES.
   B. CONTRACTOR SHALL COORDINATE AND DETERMINE EXACT DEVICE INSTALLATION CONFIGURATION WITH MANUFACTURER'S DOCUMENTATION PRIOR TO ROUGH WIRING STAGES OF CONSTRUCTION.
7. ALL AC-ONLY (NON-BATTERY) EXIT SIGNS SHALL BE CONNECTED TO LOCAL EMERGENCY LIGHTING BRANCH CIRCUIT AHEAD OF ANY CONTROLS.
8. ALL EXIT SIGNS WITH EMERGENCY BATTERY SHALL BE CONNECTED TO LOCAL LIGHTING BRANCH CIRCUIT AHEAD OF ANY CONTROLS.
9. REFER TO ELECTRICAL GENERAL NOTES, LIGHTING CONTROL GENERAL NOTES, AND LIGHTING CONTROL SCHEDULES.

ELECTRICAL KEYNOTES

L01	LIGHTING FIXTURE TO BE MOUNTED AT 8'-0" AFF BELOW BLEACHERS.
L02	EMERGENCY FIXTURE TO BE USED AS NIGHT LIGHTING AND SHALL BE ILLUMINATED WHEN BUILDING IS UNOCCUPIED.
L03	CIRCUIT ALL EXTERIOR LIGHTING FIXTURES 'WY' THROUGH RELAY FROM CIRCUIT AD-25. INSTALL RELAY IN BOX ADJACENT TO PANELBOARD 'AD'. RELAY SHALL BE CONTROLLED BY BMS SYSTEM. COORDINATE INSTALLATION WITH BMS CONTROLS CONTRACTOR. PROVIDE UNSWITCHED PHASE LEG TO EACH LIGHTING FIXTURE IN ADDITION TO THE RELAY-SWITCHED PHASE LEG.

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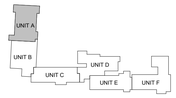

KEYPLAN

UNIT 'A' FIRST FLOOR LIGHTING PLAN

E3.1A

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PANELBOARD: PANEL 'CS1'

LOCATION: CONCESSIONS STORAGE A125 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN LUG
MOUNTING: SURFACE | **SCCR:** 22KA | **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: SWITCHBOARD 'SB-1'

PROVIDE WITH THE FOLLOWING:

CIRCUIT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CIRCUIT
CS1-1	POPCORN REC. CONC. A128 (GFCI)	20 A	1	1,200	1,200					1	20 A	ICEMAKER REC. CONC. STORAGE A125	CS1-2
CS1-3	REFRIG. REC. CONC. A128 (GFCI)	20 A	1			1,200	1,200			1	20 A	DISHWASHER REC. CONC. STORAGE A125	CS1-4
CS1-5	RECEPTACLE ROOM A125, A126, A123	20 A	1					1,080	1,200	1	20 A	FREEZER REC. CONC. STORAGE A125	CS1-6
CS1-7	RECEPTACLE LOBBY A127,VEST.,	20 A	1	1,080	720					1	20 A	RECEPTACLE CONCESSIONS A128	CS1-8
CS1-9	RECEPTACLE, UH-1 LOBBY A127, EXT.	20 A	1			1,200	360			1	20 A	RECEPTACLE CONCESSIONS A128	CS1-10
CS1-11	GYM SCOREBOARD NORTH	20 A	1					400	360	1	20 A	RECEPTACLE CONCESSIONS A128	CS1-12
CS1-13	GYM SCOREBOARD SOUTH	20 A	1	400	180					1	20 A	ISLAND REC. CONCESSIONS A128	CS1-14
CS1-15	SPOTLIGHT RECEPTACLE	20 A	1			1,200	180			1	20 A	ISLAND REC. CONCESSIONS A128	CS1-16
CS1-17								975	1,320				CS1-18
CS1-19	BLEACHERS	20 A	3	975	1,320					3	25 A	BCU-4A STORAGE A126	CS1-20
CS1-21						975	1,320						CS1-22
CS1-23	BASKETBALL BACKBOARD - SOUTHEAST	20 A	1					1,656	696	1	15 A	EF-4 CONCESSIONS A128	CS1-24
CS1-25	BASKETBALL BACKBOARD - NORTHEAST	20 A	1	1,656	1,850					1	20 A	LIGHTING - GENERAL	CS1-26
CS1-27	BASKETBALL BACKBOARD - NORTHWEST	20 A	1			1,656	2,035			1	20 A	LIGHTING - GENERAL	CS1-28
CS1-29	BASKETBALL BACKBOARD - SOUTHWEST	20 A	1					1,656	0	1	20 A	SPARE	CS1-30
CS1-31	SPARE	20 A	1	0	0					1	20 A	SPARE	CS1-32
CS1-33	SPARE	20 A	1			0	0			1	20 A	SPARE	CS1-34
CS1-35	SPARE	20 A	1					0	0	1	20 A	SPARE	CS1-36
CS1-37	SPARE	20 A	1	0	0					1	20 A	SPARE	CS1-38
CS1-39	SPARE	20 A	1			0	0			1	20 A	SPARE	CS1-40
CS1-41	SPARE	20 A	1					0	0	1	20 A	SPARE	CS1-42
		PHASE LOAD:		10,581 VA		11,326 VA		9,343 VA					

TOTAL CONNECTED LOAD: 31.3 kVA
TOTAL CONNECTED CURRENT: 87 A

NOTES:

PANELBOARD: PANEL 'EM1'

LOCATION: STORAGE A126 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN LUG
MOUNTING: SURFACE | **SCCR:** 22KA | **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: PANEL 'AD'

PROVIDE WITH THE FOLLOWING:

CIRCUIT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CIRCUIT
EM1-1	RECEPTACLE STORAGE A126	20 A	1	360	1,200					2	30 A	RECEPTACLE STORAGE A126	EM1-2
EM1-3	RECEPTACLE STORAGE A126	20 A	1			360	1,200						EM1-4
EM1-5	SPARE	20 A	1					0	0	1	20 A	SPARE	EM1-6
EM1-7	SPARE	20 A	1	0	0					1	20 A	SPARE	EM1-8
EM1-9	SPARE	20 A	1			0	0			1	20 A	SPARE	EM1-10
EM1-11	SPARE	20 A	1					0	0	1	20 A	SPARE	EM1-12
EM1-13	SPARE	20 A	1	0	0					1	20 A	SPARE	EM1-14
EM1-15	SPARE	20 A	1			0	0			1	20 A	SPARE	EM1-16
EM1-17	SPARE	20 A	1					0	0	1	20 A	SPARE	EM1-18
EM1-19	PREPARED SPACE	--	1	--	--					1	--	PREPARED SPACE	EM1-20
EM1-21	PREPARED SPACE	--	1			--	--			1	--	PREPARED SPACE	EM1-22
EM1-23	PREPARED SPACE	--	1					--	--	1	--	PREPARED SPACE	EM1-24
EM1-25	PREPARED SPACE	--	1	--	--					1	--	PREPARED SPACE	EM1-26
EM1-27	PREPARED SPACE	--	1			--	--			1	--	PREPARED SPACE	EM1-28
EM1-29	PREPARED SPACE	--	1					--	--	1	--	PREPARED SPACE	EM1-30
		PHASE LOAD:		1,560 VA		1,560 VA		0 VA					

TOTAL CONNECTED LOAD: 3.1 kVA
TOTAL CONNECTED CURRENT: 9 A

NOTES:

PANELBOARD: PANEL 'AA'

LOCATION: STORAGE A123 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN LUG
MOUNTING: SURFACE | **SCCR:** 22KA | **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: SWITCHBOARD 'SB-1'

PROVIDE WITH THE FOLLOWING:

CIRCUIT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CIRCUIT
AA-1	RECEPTACLE ROOM A121, A118	20 A	1	900	1,040					2	15 A	SSCU-1/SSAC-1 A112	AA-2
AA-3	REC. FOOTBALL LOCKER ROOM A118	20 A	1			1,008	1,040						AA-4
AA-5	RECEPTACLE COACH OFFICE A119	20 A	1					720	1,040	2	15 A	SSCU-2/SSAC-2 A107, A102	AA-6
AA-7	RECEPTACLE COACH OFFICE A152	20 A	1	720	1,040								AA-8
AA-9	REC. GIRLS VARSITY LOCKER ROOM A114	20 A	1			540	1,456			2	20 A	SSCU-3/SSAC-3 A103, A102	AA-10
AA-11	REC. GIRLS VARSITY LOCKER ROOM A114	20 A	1					540	1,456				AA-12
AA-13	EWC RECEPTACLE LOBBY A100	20 A	1	360	1,144					2	20 A	CABINET UNIT HEATERS	AA-14
AA-15	WASHER REC. LAUNDRY A113	20 A	1			1,500	1,144						AA-16
AA-17	DRYER REC. LAUNDRY A113	30 A	2					2,400	1,196	2	20 A	CABINET UNIT HEATERS	AA-18
AA-19				2,400	1,196								AA-20
AA-21	RECEPTACLE ROOM A112, A113	20 A	1			720	0			1	20 A	SPARE	AA-22
AA-23	RECEPTACLE A.T. ROOM A112	20 A	1					1,200	1,176	1	20 A	EF-7	AA-24
AA-25	RECEPTACLE A.T. ROOM A112	20 A	1	720	552								AA-26
AA-27	RECEPTACLE OFFICE A143	20 A	1			720	552			3	15 A	BCU-1A	AA-28
AA-29	REC. MENS BASKETBALL LOCKER A109	20 A	1					540	456				AA-30
AA-31	RECEPTACLE ROOM A109, A110	20 A	1	1,36	957					2	20 A	EF-6	AA-32
AA-33	RECEPTACLE COACH OFFICE A108	20 A	1			720	957						AA-34
AA-35	RECEPTACLE REF LOCKER ROOM A107	20 A	1					1,092	0	1	20 A	SPARE	AA-36
AA-37	RECEPTACLE ROOM A101, A102, A104	20 A	1	720	0					1	20 A	SPARE	AA-38
AA-39	RECEPTACLE OFFICE A103	20 A	1			900	0			1	20 A	SPARE	AA-40
AA-41	SPARE	20 A	1							1	20 A	SPARE	AA-42
AA-43	SPARE	20 A	1	0	0					1	20 A	SPARE	AA-44
AA-45	SPARE	20 A	1			0	0			1	20 A	SPARE	AA-46
AA-47	SPARE	20 A	1					0	0	1	20 A	SPARE	AA-48
AA-49	SPARE	20 A	1	0	0					1	20 A	SPARE	AA-50
AA-51	SPARE	20 A	1			0	0			1	20 A	SPARE	AA-52
AA-53	SPARE	20 A	1					0	0	1	20 A	SPARE	AA-54
AA-55	SPARE	20 A	1	0	0					1	20 A	SPARE	AA-56
AA-57	SPARE	20 A	1			0	0			3	20 A	SPARE	AA-58
AA-59	SPARE	20 A	1					0	0				AA-60
		PHASE LOAD:		13,117 VA		11,257 VA		11,912 VA					

TOTAL CONNECTED LOAD: 36.3 kVA
TOTAL CONNECTED CURRENT: 101 A

NOTES:

PANELBOARD: PANEL 'AC'

LOCATION: CORRIDOR A131 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN LUG
MOUNTING: FLUSH | **SCCR:** 22KA | **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: SWITCHBOARD 'SB-1'

PROVIDE WITH THE FOLLOWING:

CIRCUIT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CIRCUIT
AC-1	RECEPTACLE ROOM A133, A134, A131	20 A	1	720	1,092					2	20 A	CABINET UNIT HEATERS A134, A133, A130	AC-2
AC-3	RECEPTACLE ROOM A158,A134,A135,A136	20 A	1			720	1,092						AC-4
AC-5	RECEPTACLE ROOM A155,A137,A131,A149	20 A	1					720	1,092	2	20 A	CABINET UNIT HEATERS A140, A149, A138	AC-6
AC-7	EWC RECEPTACLES CORRIDOR A131	20 A	1	1,296	1,092								AC-8
AC-9	RECEPTACLE P.E OFFICE A138	20 A	1			720	696						AC-10
AC-11	RECEPTACLE ROOM A131, A148, A140	20 A	1					1,188	696	3	15 A	BCU-3A A106	AC-12
AC-13	RECEPTACLE COACHES OFFICE A150	20 A	1	720	696								AC-14
AC-15	REC. GIRLS VARSITY LOCKER ROOM A140	20 A	1			1,656	528			1	15 A	EF-3 STORAGE A106	AC-16
AC-17	RECEPTACLE, UH-1 STORAGE A106	20 A	1					1,020	180	1	20 A	ADA POWERED DOOR A130	AC-18
AC-19	RECEPTACLE HOSPITALITY ROOM A105	20 A	1	900	360					1	20 A	RECEPTACLE STORAGE A106	AC-20
AC-21	REC. (SE COUNTER) HOSP. ROOM A105	20 A	1			180	720			1	20 A	RECEPTACLE	AC-22
AC-23	REC. (SC COUNTER) HOSP. ROOM A105	20 A	1					180	0	1	20 A	SPARE	AC-24
AC-25	REC. (SW COUNTER) HOSP. ROOM A105	20 A	1	180	0					1	20 A	SPARE	AC-26
AC-27	REC. (NE COUNTER) HOSP. ROOM A105	20 A	1			180	0			1	20 A	SPARE	AC-28
AC-29	REC. (NC COUNTER) HOSP. ROOM A105	20 A	1					180	0	1	20 A	SPARE	AC-30
AC-31	REC. (NW COUNTER) HOSP. ROOM A105	20 A	1	180	0					1	20 A	SPARE	AC-32
AC-33	EF-1 LOCKER ROOM A137	25 A	1			1,920	0			1	20 A	SPARE	AC-34
AC-35	EF-2 LOCKER ROOM A136	25 A	1					1,920	0	1	20 A	SPARE	AC-36
AC-37	EXISTING UNKNOWN LOAD (NOTE 1)	15 A	1	0	0					1	20 A	SPARE	AC-38
AC-39	EXISTING UNKNOWN LOAD (NOTE 1)	100 A	2			0	0			1	20 A	SPARE	AC-40
AC-41								0	0	1	20 A	SPARE	AC-42
		PHASE LOAD:		7,236 VA		8,412 VA		7,176 VA					

TOTAL CONNECTED LOAD: 22.8 kVA
TOTAL CONNECTED CURRENT: 63 A

NOTES: 1) CONFIRM EXISTING EQUIPMENT IS STILL IN OPERATION. FOR EQUIPMENT STILL IN USE, EXTEND EXISTING BRANCH CIRCUIT TO NEW PANEL LOCATION.

PANELBOARD: PANEL 'AD'

LOCATION: ELECTRICAL ROOM A129 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN LUG
MOUNTING: SURFACE | **SCCR:** 22KA | **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: SWITCHBOARD 'SB-1'

PROVIDE WITH THE FOLLOWING:

CIRCUIT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CIRCUIT
AD-1	LTG - GIRLS VARS. & FOOTBALL LOCKERS	20 A	1	1,000	0					1	20 A	EX. LOAD - SW OUTSIDE LTG (NOTE 1)	AD-2
AD-3	LTG - BOYS BASKETBALL & REF LOCKERS	20 A	1			896	0			1	20 A	EX. LOAD - SE OUTSIDE LTG (NOTE 1)	AD-4
AD-5	LTG - CORRIDOR	20 A	1					392	0	1	20 A	EX. LOAD - SE OUTSIDE LTG (NOTE 1)	AD-6
AD-7	LTG - CORRIDOR NIGHT LIGHTING	20 A	1	224	0					1	20 A	EX. LOAD - GYM RECEPTACLES (NOTE 1)	AD-8
AD-9	LTG - LOBBY	20 A	1			972	0			1	20 A	EX. LOAD - VENTILATOR FAN (NOTE 1)	AD-10
AD-11	LTG - LOBBY	20 A	1					1,512	0	1	20 A	EX. LOAD - SPEAKERS (NOTE 1)	AD-12
AD-13	LTG -..	20 A	1	256	0					1	30 A	EX. LOAD - PUMP PIT (NOTE 1)	AD-14
AD-15	LTG - CORRIDOR A131	20 A	1			242	0			2	20 A	EX. LOAD - COMPRESSOR (NOTE 1)	AD-16
AD-17	LTG - CORRIDOR A131 NIGHT LIGHTING	20 A	1					224	0				AD-18
AD-19	LTG - TOILETS A133, A134, WOMENS LOCK	20 A	1	769	0					1	20 A	SPARE	AD-20
AD-21	LTG - BOYS LOCKER, GIRLS VARSITY A140	20 A	1			739	0			1	20 A	SPARE	AD-22
AD-23	LTG - HOSPITALITY A105, STORAGE A106	20 A	1					720	0	1	20 A	SPARE	AD-24
AD-25	LTG - EXTERIOR UNIT 'A'	20 A	1	165	0					1	20 A	SPARE	AD-26
AD-27	SPARE	20 A	1			0	0			1	20 A	SPARE	AD-28
AD-29	SPARE	20 A	1					0	0	1	20 A	SPARE	AD-30
AD-31	SPARE	20 A	1	0	0					1	20 A	SPARE	AD-32
AD-33	SPARE	20 A	1			0	0			1	20 A	SPARE	AD-34
AD-35	SPARE	20 A	1					0	0	1	20 A	SPARE	AD-36
AD-37	PANEL 'EM1'	60 A	3	1,560	0					1	20 A	SPARE	AD-38
AD-39						1,560	0			1	20 A	SPARE	AD-40
AD-41								0	0	1	20 A	SPARE	AD-42
		PHASE LOAD:		3,974 VA		4,409 VA		2,848 VA					

TOTAL CONNECTED LOAD: 11.2 kVA
TOTAL CONNECTED CURRENT: 31 A

NOTES: 1) CONFIRM EXISTING EQUIPMENT IS STILL IN OPERATION. FOR EQUIPMENT STILL IN USE, EXTEND EXISTING BRANCH CIRCUIT TO NEW PANEL LOCATION.

SWITCHBOARD: SWITCHBOARD 'SB-1'

LOCATION: ELECTRICAL ROOM A129 | **DISTRIBUTION SYSTEM:** 208Y/120V 3PH 4W | **MAINS TYPE:** MAIN CIRCUIT BREAKER
MOUNTING: FREE-STANDING ON 4" CONC. PAD | **SCCR:** 65KA | **MAINS RATING:** 1,600 A
ENCLOSURE: TYPE 1 | SUPPLY FROM: EX. XFMR 'T-UTILITY' | **MAIN OCPD RATING:** 1,600 A

PROVIDE WITH THE FOLLOWING: GROUND-FAULT PROTECTION

CIRCUIT	CIRCUIT DESCRIPTION	POLES	FRAME SIZE	TRIP RATING	Load	REMARKS
SB1-1	EX. BUSS A	3	200 A	200 A	0 VA	NOTE 1
SB1-2	EX. BUSS C	3	200 A	200 A	0 VA	NOTE 1
SB1-3	EX. PANEL 'B-B'	3	200 A	200 A	0 VA	NOTE 1
SB1-4	EX. PANEL 'B-C'	3	200 A	200 A	0 VA	NOTE 1
SB1-5	EX. PANEL 'GYM EXIT'	3	200 A	200 A	0 VA	NOTE 1
SB1-6	EX. PANEL 'A-B'	3	200 A	200 A	0 VA	NOTE 1
SB1-7	EX. BUSS C1/C2	3	400 A	400 A	0 VA	NOTE 1
SB1-8	EX. PANEL 'B-A'	3	100 A	100 A	0 VA	NOTE 1
SB1-9	EX. PANEL 'B-D'	3	100 A	100 A	0 VA	NOTE 1
SB1-10	EX. PANEL 'BOILER EXIT'	3	100 A	100 A	0 VA	NOTE 1
SB1-11	PANEL 'AC'	3	200 A	200 A	22,824 VA	
SB1-12	EX. UNKNOWN LOAD	3	200 A	200 A	0 VA	NOTE 1
SB1-13	EX. UNKNOWN LOAD	3	200 A	200 A	0 VA	NOTE 1
SB1-14	PANEL 'AA'	3	200 A	200 A	36,286 VA	
SB1-15	PANEL 'AD'	3	200 A	200 A	11,232 VA	
SB1-16	PANEL 'CS1'	3	200 A	200 A	31,250 VA	
SB1-17	SPARE	3	200 A	200 A	0 VA	
SB1-18	PREPARED SPACE	1	--	--	--	
SB1-19	PREPARED SPACE	1	--	--	--	
SB1-20	PREPARED SPACE	1	--	--	--	
SB1-21	PREPARED SPACE	1	--	--	--	
SB1-22	PREPARED SPACE	1	--	--	--	
SB1-23	PREPARED SPACE	1	--	--	--	
SB1-24	PREPARED SPACE	1	--	--	--	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
Equipment	28,149 VA	100.00%	28,149 VA
Lighting - General	11,997 VA	100.00%	11,997 VA
Motor	15,330 VA	103.13%	15,810 VA
Receptacle	46,116 VA	60.84%	28,058 VA

SWITCHBOARD TOTALS	
TOTAL CONNECTED LOAD:	101.6 kVA
TOTAL ESTIMATED DEMAND LOAD:	84.0 kVA
TOTAL CONNECTED CURRENT:	282 A
TOTAL EST. DEMAND CURRENT:	233 A

NOTES: 1) CONFIRM EXISTING FUSE SIZE AND MATCH NEW CIRCUIT BREAKER TO FUSE SIZE.

gmb
Maze Design, Inc.

WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.16.2025 ADDENDUM 001
01.22.2025 ADDENDUM 002

DRAWN JDM
REVIEWED SMS

PROJECT NO. 5-6394

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POWER DISTRIBUTION EQUIPMENT SCHEDULES

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LIGHTING FIXTURE SCHEDULE

TYPE / TAG	DESCRIPTION	APPROVED MANUFACTURERS & CATALOG NUMBERS: BASIS	EQUIVALENT #1	EQUIVALENT #2	FINISH	MOUNTING	LIGHT SOURCE: MIN. DELIVERED LUMENS	LIGHT SOURCE: TYPE	DRIVER / BALLAST TYPE	INPUT VOLTAGE (V)	INPUT POWER (W)	NOTES
A2	2'x4' RECESSED LED FLAT PANEL, FULLY-LUMINOUS DIFFUSE ACRYLIC LENS FRAMED IN EXTRUDED ALUMINUM BEZEL, DLC QUALIFIED	LITHONIA: CPX-2X4-AL08-80CRI-SWW7-SWL-MVOLT	COLUMBIA: CBT24-B-LSCS-EDD-34	METALUX: 24CGT4540C	WHITE	RECESSED IN ACOUSTICAL GRID CEILING	3300	4000K LED	0-10V DIMMING	120 V	28	
A2E	2'x4' RECESSED LED FLAT PANEL, FULLY-LUMINOUS DIFFUSE ACRYLIC LENS FRAMED IN EXTRUDED ALUMINUM BEZEL, DLC QUALIFIED, EMERGENCY BATTERY	LITHONIA: CPX-2X4-AL08-80CRI-SWW7-SWL-MVOLT	COLUMBIA: CBT24-B-LSCS-EDD-34	METALUX: 24CGT4540C EL14W	WHITE	RECESSED IN ACOUSTICAL GRID CEILING	3300	4000K LED	0-10V DIMMING	120 V	28	
A3	1'x4' RECESSED LED FLAT PANEL, FULLY-LUMINOUS DIFFUSE ACRYLIC LENS FRAMED IN EXTRUDED ALUMINUM BEZEL, DLC QUALIFIED	LITHONIA: CPX-1X4-AL07-80CRI-SWW7-SWL-MVOLT	COLUMBIA: CBT24-B-LSCS-EDD-34	METALUX: 14CGT4040C	WHITE	RECESSED IN ACOUSTICAL GRID CEILING	4094	4000K LED	0-10V DIMMING	120 V	36	
A3E	1'x4' RECESSED LED FLAT PANEL, FULLY-LUMINOUS DIFFUSE ACRYLIC LENS FRAMED IN EXTRUDED ALUMINUM BEZEL, DLC QUALIFIED, EMERGENCY BATTERY	LITHONIA: CPX-1X4-AL07-80CRI-SWW7-SWL-MVOLT	COLUMBIA: CBT24-B-LSCS-EDD-34	METALUX: 14CGT4040C EL14W	WHITE	RECESSED IN ACOUSTICAL GRID CEILING	4094	4000K LED	0-10V DIMMING	120 V	36	
B3	X' LENGTH INDUSTRIAL LED LUMINAIRE	LITHONIA: CLX L48 4000LM SEF FDL MVOLT GZ1 40K 80CRI	COLUMBIA: MPS4-40VW-CW-ED1U	METALUX: 4SNX-315L-SLW-UNV-L840-CD1-U	WHITE	SURFACE MOUNT OR SUSPENDED, REFER TO DRAWING	3061	4000K LED	0-10V DIMMING	120 V	18	
B3E	X' LENGTH INDUSTRIAL LED LUMINAIRE, EMERGENCY BATTERY	LITHONIA: CLX L48 4000LM SEF FDL MVOLT GZ1 40K 80CRI	COLUMBIA: MPS4-40VW-CW-ED1U	METALUX: 4SNX-315L-SLW-UNV-L840-CD1-U	WHITE	SURFACE MOUNT OR SUSPENDED, REFER TO DRAWING	3061	4000K LED	0-10V DIMMING	120 V	18	
E1	EMERGENCY LIGHTING UNIT, AMABLE OPTICS, BATTERY OPERATED	LITHONIA: ELM2L SDRT	COMPASS: CLDSO	COOPER: SELHP100RSBD	WHITE	WALL MOUNTED AT 7' - 0" AFF	N/A	N/A	N/A	120 V	2.4	
F1	6" RECESSED ROUND FIXTURE, MEDIUM BEAM DISTRIBUTION, WET LOCATION LISTED, SHALLOW HOUSING	GOTHAM: IVO6S D 15LM 40K 80CRI MD MIN10 MVOLT ZT WL P AR LSS F	PRESCOLITE: LBRP-M-L-SML-CS9-WD LBRP-6RD-T-O	PORTFOLIO: LDS6C 30 D010 ELB S 1 H	WHITE	RECESSED IN CEILING	2700	4000K LED	0-10V DIMMING	120 V	25	
G1	LED HIGH BAY, MINIMUM 10% UPLIGHT, FROSTED PRISMATIC LENS, WIDE DISTRIBUTION, WIRE GUARD OR IMPACT RESISTANT LENS.	HOLOPHANE: PHG-36000-SEF-WGG-MVOLT-40K-80CRI-PM	CREE: VUE-A-UV-24L-40K8-M-UL-10V	METALUX: SSLED LDS 24 M UNV L840 CD 2	WHITE	SUSPENDED FROM EXPOSED CEILING STRUCTURE	24000	4000K LED	0-10V DIMMING	120 V	185	
G1E	SAME AS G1 BUT WITH EMERGENCY BATTERY	HOLOPHANE: PHG-36000-SEF-WGG-MVOLT-40K-80CRI-PM	CREE: VUE-A-UV-24L-40K8-M-UL-10V	METALUX: SSLED LDS 24 M UNV L840 EL20WREM CD 2	WHITE	SUSPENDED FROM EXPOSED CEILING STRUCTURE	24000	4000K LED	0-10V DIMMING	120 V	185	
L2	XX' LENGTH SUSPENDED LINEAR FIXTURE, EXTRUDED ALUMINUM BODY, FLUSH LENS, DIRECT/INDIRECT OPTICS	FINELITE: HPX-F-ID-XX'-S-B-840-TG-F-277-SC-FC-10%-FE-SW	LITECONTROL: 2L-P-ID-STD-XX'-08-SOF-C1-40K9-I070-D030-D01-2C--UNV-FA1	LUMENWERX: V4A DI HLO FH WX02 SW 80CRI 730LMF 350LMF 40K XFTXN UNV D1 1C NA ACS W	WHITE	SUSPENDED AT 14' - 0" AFF	3061	4000K LED	0-10V DIMMING	120 V	18	
L2E	XX' LENGTH SUSPENDED LINEAR FIXTURE WITH BATTERY BACKUP, EXTRUDED ALUMINUM BODY, FLUSH LENS, DIRECT/INDIRECT OPTICS, EMERGENCY BATTERY	FINELITE: HPX-F-ID-XX'-S-B-840-TG-F-277-SC-FC-10%-FE-SW-L-GD10	LITECONTROL: 2L-P-ID-STD-XX'-08-SOF-C1-40K9-I070-D030-D01-2C--UNV-FA1	LUMENWERX: V4A DI HLO FH WX02 SW 80CRI 730LMF 350LMF 40K XFTXN UNV D1 1C 1EMB ACS W	WHITE	SUSPENDED AT 14' - 0" AFF	3061	4000K LED	0-10V DIMMING	120 V	18	
W1	WALL MOUNT LED AREA LIGHT, DIE CAST, ALUMINUM HOUSING, TRAPEZOIDAL, ZERO UPLIGHT, TYP IV DISTRIBUTION, WET LOCATION LISTED	LITHONIA: WDGE2-P3-40K-80CRI-VW-MVOLT-SRM-DBLXD	HUBBELL: TRP2-24L-50-4K7-4-UNV-BLT	MCGRAW EDISON:1ST-SA1-D-740-U-T4FT-BK	BLACK	WALL MTD ON EXTERIOR AT 7' -6" AFF UNLESS NOTED OTHERWISE	5800	4000K LED	INTEGRAL	120 V	15	
W2	4' WALL MOUNTED LED, VANDAL RESISTANT	KENALL: N548W-P-1-25L40K-DV	NEW-STAR: VIC 4 N L2 40 1C RW UN WH	FAILSAFE: HVSL2 SQ 4 LD4 STD 40 UNV O EDD1	WHITE	WALL MTD AT 7' - 6" UNLESS NOTED OTHERWISE	3429	4000K LED	INTEGRAL	120 V	28	
W2E	4' WALL MOUNTED LED, VANDAL RESISTANT, EMERGENCY BATTERY	KENALL: N548W-P-1-25L40K-DV	NEW-STAR: VIC 4 N L2 40 1C RW UN WH	FAILSAFE: HVSL2 SQ 4 LD4 STD 40 UNV O EDD1 EL10W	WHITE	WALL MTD AT 7' - 6" UNLESS NOTED OTHERWISE	3429	4000K LED	INTEGRAL	120 V	28	
X1E	EXIT SIGN, DIE-CAST HOUSING, SINGLE FACE, EMERGENCY BATTERY OPERATION, SELF-DIAGNOSTIC, UL924 LISTING, ARROWS AND MOUNTINGS SHOWN ON DRAWINGS	DUAL-LITE: SEDRWEI	LITHONIA: LE-S-W-1-R-EL N-SD	SURE-LITES: CX71WHSD	WHITE HOUSING, WHITE FACE	SURFACE ON CEILING OR WALL: REFER TO DRAWINGS FOR CONFIGURATION/ORIENTATION	N/A	RED LED	INTEGRAL	120 V	3	2
X2E	EXIT SIGN, DIE-CAST HOUSING, DOUBLE FACE, EMERGENCY BATTERY OPERATION, SELF-DIAGNOSTIC, UL924 LISTING, ARROWS AND MOUNTINGS SHOWN ON DRAWINGS	DUAL-LITE: SEDRWEI	LITHONIA: LE-S-W-2-R-EL N-SD	SURE-LITES: CX72WHSD	WHITE HOUSING, WHITE FACE	SURFACE ON CEILING OR WALL: REFER TO DRAWINGS FOR CONFIGURATION/ORIENTATION	N/A	RED LED	INTEGRAL	120 V	3	2

LIGHTING CONTROL INTENT NARRATIVE (CIN) SCHEDULE

NARRATIVE I.D.	DESCRIPTION	CONTROL FUNCTION DESCRIPTIONS (ASHRAE/IES 90.1-2013 REFERENCE): LOCAL CONTROL (9.4.1.1[a])	ON MODE (9.4.1.1[b,c])	BI-LEVEL LIGHTING CONTROL (9.4.1.1[d])	DAYLIGHT RESPONSIVE CONTROLS (9.4.1.1[e,f])	OFF MODE (9.4.1.1[g,h,i])	NETWORK TYPE (REFER TO SECTION 26 09 43): ROOM-BASED	NETWORK TYPE (REFER TO SECTION 26 09 43): BUILDING-WIDE	INTEGRATION (REFER TO SECTION 26 09 43): HVAC EQUIPMENT / BUILDING MANAGEMENT / TEMPERATURE CONTROL SYSTEM (OCCUPANCY STATUS OUTPUT, PLUS OTHER FUNCTIONS PER SPECIFICATION): LOCAL ROOM INTERFACE (CONTACT CLOSURE)	INTEGRATION (REFER TO SECTION 26 09 43): HVAC EQUIPMENT / BUILDING MANAGEMENT / TEMPERATURE CONTROL SYSTEM (OCCUPANCY STATUS OUTPUT, PLUS OTHER FUNCTIONS PER SPECIFICATION): CENTRAL GATEWAY PROTOCOL INTERFACE VIA NLCS BACKBONE NETWORK	INTEGRATION (REFER TO SECTION 26 09 43): RESTORE EGRESS LIGHTING UPON FIRE ALARM CONDITION: LOCAL ROOM INTERFACE (CONTACT CLOSURE)	INTEGRATION (REFER TO SECTION 26 09 43): RESTORE EGRESS LIGHTING UPON FIRE ALARM CONDITION: CENTRAL GATEWAY PROTOCOL INTERFACE VIA NLCS BACKBONE NETWORK	ADDITIONAL NOTES
CIN-01	TYPICAL OCCUPIABLE ROOM	WALL SWITCH(ES) (ON / OFF / DIM UP / DIM DOWN) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S)	MANUAL ON VIA LOCAL WALL CONTROL(S)	0-10VDC CONTINUOUS DIMMING OF LIGHTING WITHIN ONE OR MORE CONTROL ZONES; REFER TO PLAN (SINGLE CONTROL ZONE UNLESS OTHERWISE SHOWN)	WHERE INDICATED, OPEN-LOOP PHOTOCONTROL(S) AUTOMATICALLY REDUCE THE ELECTRIC LIGHTING WITHIN EACH PRIMARY/SECONDARY SIDELIGHTING AND/OR ROOF MONITOR DAYLIGHT ZONE VIA 5-10VDC CONTINUOUS DIMMING	AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S), SET FOR 20-MINUTE TIMEOUT PERIOD	X		X				
CIN-02	PUBLIC TRANSITION SPACE	LINE-VOLTAGE LOCKING TOGGLE SWITCH(ES) (SECTION 26 27 26) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S), CONNECT ON LOAD SIDE OF AUTOMATIC LIGHTING CONTROL DEVICES	AUTOMATIC ON VIA OCCUPANCY SENSOR	N/A	N/A	AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S), SET FOR 20-MINUTE TIMEOUT PERIOD		X		X		X	
CIN-06	ELECTRICAL / MECHANICAL	LINE-VOLTAGE TOGGLE SWITCH(ES) (SECTION 26 27 26) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S)	MANUAL VIA SWITCH	N/A	N/A	MANUAL VIA SWITCH	N/A	N/A	N/A	N/A	N/A	N/A	NO AUTOMATIC LIGHTING CONTROLS
CIN-07	RESTROOM, MULTIPLE OCCUPANCY	LINE-VOLTAGE LOCKING TOGGLE SWITCH(ES) (SECTION 26 27 26) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S), CONNECT ON LOAD SIDE OF AUTOMATIC LIGHTING CONTROL DEVICES	AUTOMATIC ON VIA OCCUPANCY SENSOR	N/A	N/A	AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S), SET FOR 20-MINUTE TIMEOUT PERIOD	X			X			
CIN-09	STORAGE, >= 50 SQ. FT.	WALL SWITCH(ES) (ON / OFF) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S)	MANUAL ON VIA LOCAL WALL CONTROL(S)	N/A	N/A	AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S), SET FOR 15-MINUTE TIMEOUT PERIOD	X			X			
CIN-09A	STORAGE, >= 50 SQ. FT.	LINE-VOLTAGE WALL-BOX OCCUPANCY SENSOR (SECTION 26 09 23), REFER TO PLAN FOR LOCATION(S)	MANUAL ON VIA LOCAL WALL CONTROL(S)	N/A	N/A	AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S), SET FOR 15-MINUTE TIMEOUT PERIOD							
CIN-12	GYMNASIUM, PLAYING AREA	WALL SWITCH(ES) (ON / OFF / DIM UP / DIM DOWN) AT ONE OR MORE LOCATIONS WITHIN SPACE; REFER TO PLAN FOR LOCATION(S)	MANUAL ON VIA LOCAL WALL CONTROL(S)	0-10VDC CONTINUOUS DIMMING OF LIGHTING WITHIN ONE OR MORE CONTROL ZONES; REFER TO PLAN (SINGLE CONTROL ZONE UNLESS OTHERWISE SHOWN)		AUTOMATIC FULL OFF UPON SPACE VACANCY VIA SENSOR(S) (INDEPENDENT SENSOR ZONES FOR NO MORE THAN 5,000 SQ. FT.), SET FOR 20-MINUTE TIMEOUT PERIOD		X		X		X	AUTOMATIC ON/OFF VIA OCCUPANCY SENSOR FOR DESIGNATED EMERGENCY/EGRESS FIXTURES ONLY TO PROVIDE WALK-THROUGH LIGHTING
	EXTERIOR LIGHTING, SITE POLES												CONTROL VIA BMS ON AT SUNSET WITH ASTRONOMIC TIME SCHEDULE (WITH USER ADJUSTABLE OFFSET +/- 30 MIN.) OFF AT MIDNIGHT ON AT 6:00 A.M. OFF AT SUNRISE WITH ASTRONOMIC TIME SCHEDULE (WITH USER ADJUSTABLE OFFSET +/- 30 MIN.) PROVIDE ABILITY FOR USER TO INITIATE MANUAL OR SCHEDULED OVERRIDE ON PERIOD.
	EXTERIOR LIGHTING, BUILDING-MOUNTED (AND FLAGPOLE LIGHTING IF PRESENT)												CONTROL VIA BMS ON AT SUNSET WITH ASTRONOMIC TIME SCHEDULE (WITH USER ADJUSTABLE OFFSET +/- 30 MIN.) OFF AT SUNRISE WITH ASTRONOMIC TIME SCHEDULE (WITH USER ADJUSTABLE OFFSET +/- 30 MIN.) PROVIDE ABILITY FOR USER TO INITIATE MANUAL OR SCHEDULED OVERRIDE ON PERIOD.

LIGHTING CONTROL INTENT NARRATIVE - SPACE SCHEDULE

SPACE I.D.	SPACE TYPE (ASHRAE/IES 90.1 TABLE 9.6.1)
CIN-01	
A103 OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A105 HOSPITALITY ROOM	CONFERENCE/MEETING/MULTIPURPOSE
A108 COACH OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A112 A.T. ROOM	OFFICE - ENCLOSED, GREATER THAN 250SF
A113 LAUNDRY	LAUNDRY/WASHING AREA
A119 COACH OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A138 P.E OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A143 OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A150 COACHES OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
A152 COACH OFFICE	OFFICE - ENCLOSED, 250 SF OR LESS
CIN-02	
A101 VEST.	CORRIDOR
A102 HALL	CORRIDOR
A117 Space	CORRIDOR
A130 VEST.	CORRIDOR
A131 CORRIDOR	CORRIDOR
A132 VEST.	CORRIDOR
A192 Space	CORRIDOR
S-1 STAIRS	STAIRWELL
S-2 STAIRS	STAIRWELL
CIN-06	
A129 ELECTRICAL ROOM	ELECTRICAL/MECHANICAL
CIN-07	
A107 REF LOCKER ROOM	LOCKER ROOM
A109 MENS BASKETBALL LOCKER ROOM	LOCKER ROOM
A111 TOILET	LOCKER ROOM
A114 GIRLS VARSITY LOCKER ROOM	LOCKER ROOM
A115 TOILET	LOCKER ROOM
A118 FOOTBALL LOCKER ROOM	LOCKER ROOM
A120 TOILET	LOCKER ROOM
A133 WOMENS TOILET	RESTROOMS
A134 MENS TOILET	RESTROOMS
A136 LOCKER ROOM	LOCKER ROOM
A137 LOCKER ROOM	LOCKER ROOM
A149 TOILET	LOCKER ROOM
A153 SHOWER	LOCKER ROOM
A154 SHOWER	LOCKER ROOM
A155 MENS TOILET	LOCKER ROOM
A156 SHOWER	LOCKER ROOM
A157 SHOWER	LOCKER ROOM
A158 WOMENS TOILET	LOCKER ROOM
A159 SHOWER	LOCKER ROOM
A163 Space	LOCKER ROOM
CIN-09	
A104 ATHLETIC STORAGE	STORAGE - 50 SF TO 1000 SF
A106 STORAGE	STORAGE - 50 SF TO 1000 SF
A123 STORAGE	STORAGE - 50 SF TO 1000 SF
A125 CONCESSIONS STORAGE	STORAGE - 50 SF TO 1000 SF
A126 STORAGE	STORAGE - GREATER THAN 1000 SF
A135 CUSTODIAL	STORAGE - 50 SF TO 1000 SF
A151 STORAGE	STORAGE - 50 SF TO 1000 SF
CIN-09A	
A110 STORAGE	STORAGE - 50 SF TO 1000 SF
A121 STORAGE	STORAGE - 50 SF TO 1000 SF
A148 STORAGE	STORAGE - 50 SF TO 1000 SF
CIN-12	
A122 GYMNASIUM	GYMNASIUM/FITNESS CENTER - PLAYING AREA

INTERIOR LIGHTING POWER DENSITY (LPD) COMPLIANCE (SPACE-BY-SPACE METHOD)

SPACE I.D.	FLOOR AREA	ALLOWED LPD (TABLE 9.6.1)	ALLOWED LIGHTING POWER	PROPOSED LIGHTING POWER	PROPOSED LPD	NOTED EXEMPTIONS / ALLOWANCES / ADJUSTMENTS
A101 VEST.	230 SF	0.66 W/ft²	152 W	56 W	0.24 W/ft²	
A102 HALL	167 SF	0.66 W/ft²	110 W	108 W	0.65 W/ft²	
A103 OFFICE	195 SF	1.11 W/ft²	216 W	144 W	0.74 W/ft²	
A104 ATHLETIC STORAGE	143 SF	0.63 W/ft²	90 W	36 W	0.25 W/ft²	
A105 HOSPITALITY ROOM	462 SF	1.23 W/ft²	568 W	288 W	0.62 W/ft²	
A106 STORAGE	762 SF	0.63 W/ft²	480 W	144 W	0.19 W/ft²	
A107 REF LOCKER ROOM	169 SF	0.75 W/ft²	127 W	86 W	0.51 W/ft²	
A108 COACH OFFICE	140 SF	1.11 W/ft²	156 W	56 W	0.40 W/ft²	
A109 MENS BASKETBALL LOCKER ROOM	623 SF	0.75 W/ft²	467 W	234 W	0.38 W/ft²	
A110 STORAGE	84 SF	0.63 W/ft²	53 W	36 W	0.43 W/ft²	
A111 TOILET	154 SF	0.75 W/ft²	115 W	2 W	0.02 W/ft²	
A112 A.T. ROOM	333 SF	1.11 W/ft²	370 W	140 W	0.42 W/ft²	
A113 LAUNDRY	88 SF	0.60 W/ft²	53 W	72 W	0.82 W/ft²	
A114 GIRLS VARSITY LOCKER ROOM	620 SF	0.75 W/ft²	465 W	237 W	0.38 W/ft²	
A115 TOILET	144 SF	0.75 W/ft²	108 W	74 W	0.52 W/ft²	
A117 Space	140 SF	0.66 W/ft²	93 W	58 W	0.42 W/ft²	
A118 FOOTBALL LOCKER ROOM	670 SF	0.75 W/ft²	503 W	236 W	0.35 W/ft²	
A119 COACH OFFICE	88 SF	1.11 W/ft²	98 W	56 W	0.64 W/ft²	
A120 TOILET	154 SF	0.75 W/ft²	115 W	110 W	0.72 W/ft²	
A121 STORAGE	72 SF	0.63 W/ft²	45 W	36 W	0.50 W/ft²	
A122 GYMNASIUM	11,412 SF	1.20 W/ft²	13,695 W	5,550 W	0.49 W/ft²	
A123 STORAGE	597 SF	0.63 W/ft²	376 W	90 W	0.15 W/ft²	
A125 CONCESSIONS STORAGE	357 SF	0.63 W/ft²	225 W	54 W	0.15 W/ft²	
A126 STORAGE	1,841 SF	0.63 W/ft²	1,160 W	28 W	0.02 W/ft²	
A129 ELECTRICAL ROOM	125 SF	0.42 W/ft²	52 W	18 W	0.14 W/ft²	
A130 VEST.	239 SF	0.66 W/ft²	157 W	56 W	0.23 W/ft²	
A131 CORRIDOR	1,290 SF	0.66 W/ft²	851 W	283 W	0.22 W/ft²	
A132 VEST.	79 SF	0.66 W/ft²	52 W	28 W	0.36 W/ft²	
A133 WOMENS TOILET	302 SF	0.98 W/ft²	296 W	254 W	0.84 W/ft²	
A134 MENS TOILET	302 SF	0.98 W/ft²	296 W	254 W	0.84 W/ft²	
A135 CUSTODIAL	67 SF	0.63 W/ft²	43 W	36 W	0.53 W/ft²	
A136 LOCKER ROOM	298 SF	0.75 W/ft²	201 W	89 W	0.33 W/ft²	
A137 LOCKER ROOM	298 SF	0.75 W/ft²	224 W	89 W	0.30 W/ft²	
A138 P.E OFFICE	167 SF	1.11 W/ft²	185 W	56 W	0.34 W/ft²	
A143 OFFICE	100 SF	1.11 W/ft²	111 W	56 W	0.56 W/ft²	
A148 STORAGE	88 SF	0.63 W/ft²	55 W	36 W	0.41 W/ft²	
A149 TOILET	175 SF	0.75 W/ft²	131 W	110 W	0.63 W/ft²	
A150 COACHES OFFICE	127 SF	1.11 W/ft²	142 W	56 W	0.44 W/ft²	
A151 STORAGE	101 SF	0.63 W/ft²	64 W	36 W	0.36 W/ft²	
A152 COACH OFFICE	88 SF	1.11 W/ft²	98 W	56 W	0.64 W/ft²	
A153 SHOWER	25 SF	0.75 W/ft²	19 W	25 W	1.00 W/ft²	
A154 SHOWER	28 SF	0.75 W/ft²	21 W	25 W	0.89 W/ft²	
A155 MENS TOILET	200 SF	0.75 W/ft²	150 W	110 W	0.55 W/ft²	
A156 SHOWER	31 SF	0.75 W/ft²	23 W	25 W	0.81 W/ft²	
A157 SHOWER	30 SF	0.75 W/ft²	23 W	25 W	0.83 W/ft²	
A158 WOMENS TOILET	203 SF	0.75 W/ft²	152 W	110 W	0.54 W/ft²	
A159 SHOWER	27 SF	0.75 W/ft²	20 W	25 W	0.91 W/ft²	
A163 Space	25 SF	0.75 W/ft²	19 W	25 W	1.00 W/ft²	
A192 Space	65 SF	0.66 W/ft²	43 W	28 W	0.43 W/ft²	
S-1 STAIRS	213 SF	0.69 W/ft²	147 W	56 W	0.26 W/ft²	
S-2 STAIRS	213 SF	0.69 W/ft²	147 W	56 W	0.26 W/ft²	
GRAND TOTAL	24,522 SF		23,562 W	9,957 W		

LIGHTING FIXTURE SCHEDULE GENERAL NOTES:

A. MODEL NUMBERS GIVEN IN THIS SCHEDULE MAY NOT INCLUDE ALL OPTIONS AND ACCESSORIES AS NECESSARY TO MEET THE REQUIREMENTS OF THE DESCRIPTION AND SPECIFICATIONS.

B. CONTRACTOR SHALL PROVIDE ALL NECESSARY MOUNTING HARDWARE FOR EACH FIXTURE TYPE. COORDINATE WITH CEILING TYPES AND MOUNTING LOCATIONS.

C. ALL FINISHES SHALL BE CHOSEN FROM THE MANUFACTURER'S CATALOGED/STANDARD OPTIONS UNLESS OTHERWISE NOTED.

D. ALL INTERIOR LIGHT SOURCES SHALL HAVE COLOR RENDERING INDEX RATING OF 80 OR GREATER. ALL EXTERIOR LIGHT SOURCES SHALL HAVE COLOR RENDERING INDEX RATING OF 70 OR GREATER.

E. ALL FIXTURES SHALL BE SUPPLIED WITH UNIVERSAL VOLTAGE INPUT (120/277V) WHERE AVAILABLE FROM THE MANUFACTURER. VOLTAGE LISTED IN THE SCHEDULE IS INTENDED UTILIZATION VOLTAGE.

F. REFER TO THE PLAN DRAWINGS FOR LOCATIONS OF EMERGENCY-DUTY FIXTURES, INCLUDING FIXTURES WITH MULTIPLE CIRCUITS AND/OR EMERGENCY-DUTY SUBSECTIONS. ALL EMERGENCY-DUTY FIXTURES SHALL BE WIRED AND CIRCUITED PER NEC ARTICLE 700 RULES.

G. TO MAINTAIN A UNIFORM AND COORDINATED APPEARANCE ACROSS THE PROJECT, ONLY ONE APPROVED MANUFACTURER SHALL BE SELECTED FOR MULTIPLE FIXTURE TYPES AMONG WHICH A SIMILAR STYLE OR SERIES IS INTENDED. NON-CONFORMANCE SHALL BE JUDGED AT THE ENGINEER'S DISCRETION AND MAY REQUIRE CONTRACTOR'S RESELECTION OF SOME TYPES WITHIN THE LIST OF APPROVED MANUFACTURERS.

H. A BREAK-OUT COST SHALL BE MADE AVAILABLE TO THE BIDDING CONTRACTOR(S) FOR ANY FIXTURE TYPES WHICH LIST A SINGLE PRODUCT. THIS PRICING SHALL BE FURNISHED TO THE ARCHITECT/ENGINEER, CONSTRUCTION MANAGER, AND/OR OWNER UPON REQUEST.

LIGHTING FIXTURE SCHEDULE LINE ITEM NOTES:

1. EMERGENCY LIGHTING CONTROL DEVICES SHALL BE WIRED WITH SUPPLY FROM EMERGENCY LIGHTING CIRCUIT, AND FROM NORMAL/UTILITY LIGHTING CIRCUIT, BOTH LINE AND LOAD SIDE OF RESPECTIVE CONTROL DEVICE(S) FOR THE LIGHTING CONTROL ZONE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.

2. EMERGENCY LIGHTING UNIT EQUIPMENT (INCLUDING BATTERY PACKS, EXIT SIGNS, INVERTERS, ETC.) SHALL HAVE 5-YEAR MANUFACTURER WARRANTY. TEST SWITCH AND CHARGE INDICATOR LIGHT. PROVIDE UNSWITCHED HOT CONDUCTOR FROM RESPECTIVE LOCAL LIGHTING CIRCUIT TO THE BATTERY.

3. COORDINATE EXACT LOCATIONS OF FIXTURES IN UTILITY ROOMS WITH EQUIPMENT, DUCTWORK, PIPING, ETC. IN FIELD TO ACHIEVE UNIFORM ILLUMINATION.

4. PROVIDE FEED POINT ON ENTIRE TRACK SYSTEM ARRANGEMENT WITH 3A CURRENT LIMITER DEVICE AS REQUIRED FOR NEC COMPLIANCE.

5. PROVIDE FEED POINT ON ENTIRE TRACK SYSTEM ARRANGEMENT WITH 12A CURRENT LIMITER DEVICE AS REQUIRED FOR NEC COMPLIANCE.

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

ISSUANCES

01.06.2025 BIDS & CONSTRUCTION
01.22.2025 ADDENDUM 002

DRAWN JDM
REVIEWED SMS

PROJECT NO. 5-6394

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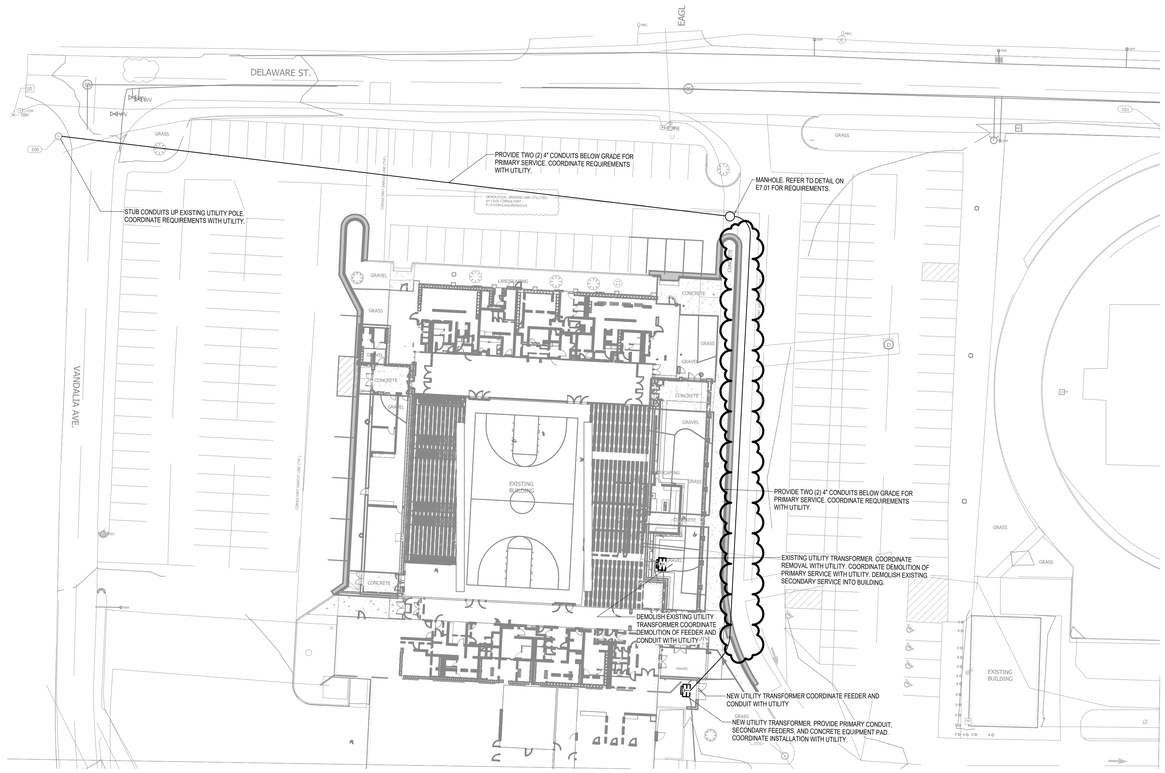
LIGHTING FIXTURE SCHEDULE

E5.10



SITE ELECTRICAL PLAN

1" = 30'-0"

ELECTRICAL SITE GENERAL NOTES

1. REFER TO SITE/CIVIL PLANS FOR ADDITIONAL INFORMATION.
2. LOCATIONS SHOWN FOR EXISTING UTILITIES (IF ANY) ARE APPROXIMATE AND DERIVED FROM GENERAL OBSERVATION AND/OR AVAILABLE RECORDS. THIS PLAN SHALL NOT BE INTERPRETED AS SHOWING EXACT LOCATIONS OR SHOWING ALL UTILITIES IN THE AREA.
3. CONTRACTOR SHALL FIELD-VERIFY LOCATIONS, SIZES, AND TYPES OF ALL EXISTING UNDERGROUND UTILITIES, CONDUITS, AND CABLES PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES TO IDENTIFY PUBLIC UTILITIES. VERIFY ALL PRIVATE UTILITIES WITH OWNER RECORDS AND MAINTENANCE PERSONNEL.
4. PROTECT THE SITE, ADJACENT PROPERTY, AND UTILITY SERVICES FROM DAMAGE OR DISRUPTION OF SERVICE/ACCESS. DAMAGE TO EXISTING STRUCTURES, SITE, OR UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
5. ALL UNDERGROUND CONDUIT SHALL BE RIGID NONMETALLIC (RNC) TYPE. ALL UNDERGROUND BENDS/ELBOWS SHALL BE GALVANIZED RIGID METALLIC (RMC) TYPE. PROTECTED FROM CORROSION PER CONDUIT SPECIFICATION REQUIREMENTS.
6. INSTALL DETECTABLE UNDERGROUND WARNING TAPE ABOVE ALL UNDERGROUND CONDUITS AND CABLES, COLOR PER APWA UNIFORM COLOR CODE (RED FOR ELECTRIC POWER/LIGHTING, ORANGE FOR COMMUNICATIONS/ALARM/SIGNAL). REFER TO SPECIFICATIONS.
7. ALL EXISTING TREES TO REMAIN SHALL BE CAREFULLY PROTECTED. DO NOT DRIVE HEAVY EQUIPMENT WITHIN 12 FEET OF TREE TRUNKS. BRANCHES WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION SHALL BE CUT OUT AS DIRECTED BY THE ARCHITECT/ENGINEER. ANY ROOTS OF EXISTING TREES TO REMAIN WHICH ARE EXPOSED DUE TO DEMOLITION SHALL BE COVERED WITHIN 6 HOURS WITH SOIL. DAMAGED TREES SHALL BE REPLACED AT THE DISCRETION OF THE ARCHITECT/ENGINEER AT THE EXPENSE OF THE CONTRACTOR RESPONSIBLE FOR THE DAMAGE.
8. PATCH AND REPAIR GRASS AND/OR OTHER IMPROVED PLANTINGS AS REQUIRED WHERE NEW UNDERGROUND CONDUITS, CABLES, AND/OR DUCTBANKS ARE INSTALLED. CONTRACTOR SHALL BACKFILL TRENCHES, LEVEL OUT SOIL, FLUSH WITH GRADE, AND REMOVE ANY EXCESS MATERIAL PRIOR TO SEEDING REPAIR.
9. CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND REPAIR ANY EXISTING SURFACE FINISHES AND OTHER ITEMS THAT ARE DISTURBED DURING THE COURSE OF DEMOLITION AND CONSTRUCTION, INCLUDING GRASS, CONCRETE, ASPHALT, LANDSCAPING, FENCING, STRUCTURES, IRRIGATION, UNDERGROUND UTILITIES, ETC.

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WESTERN WAYNE SCHOOLS ADDITIONS & RENOVATIONS - BID PACKAGE #1

WESTERN WAYNE SCHOOLS

CAMBRIDGE CITY, INDIANA

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SITE ELECTRICAL PLAN

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